COMMONWEALTH MYCOLOGICAL INSTITUTE

C. A. B.
20 JAN 1954
FILE

REVIEW
OF
APPLIED MYCOLOGY

VOL. XXXII DECEMBER 1953

STONER (W. N.) & MOORE (W. D.). **Lowland Rice farming, a possible cultural control for Sclerotinia sclerotiorum in the Everglades.**—*Plant Dis. Reptr*, 37, 4, pp. 181–186, 3 figs., 1953. [Multilithed.]

In investigations of the control of *Sclerotinia sclerotiorum* on vegetables in the Florida Everglades [*R.A.M.*, 31, p. 543], sclerotia held between plastic screens in a wooden frame and buried at a depth of 3 in. were completely rotted in 20 days when the field was flooded with moving water (to an average depth of 4 in. and at a floodgate discharge of 9·7 gals. per minute in pilot experiments), compared with a minimum of 35 days required with static water. Whole sclerotia or fragments thereof rotted very rapidly when the covering was abraded. It is hoped that this effective and economical control method may be fitted into a satisfactory rotational programme in the area, since rice can be grown on infested, high value vegetable land in summer.

BREMER (H.). **Der falsche Mehltau des Kohls (Peronospora brassicae Gäumann). Ein Sammelbericht.** [Downy mildew of Cabbage (*Peronospora brassicae* Gäumann). A compilation.]—*Z. PflKrankh.*, 60, 3, pp. 126–127, 1953.

The author's survey of recent information on cabbage downy mildew (*Peronospora brassicae*) [*P. parasitica*] and its control is based on 20 contributions to the literature, most of which have been noticed in this *Review*.

SPENCER (D. M.) & GLASSCOCK (H. H.). **Crook root of Watercress.**—*Plant Path.*, 2, 1, pp. 19–21, 1 pl., 1953.

During the last decade watercress growers in Great Britain have experienced diminishing yields, reduction amounting to 30 per cent. in some areas, with complete failure of individual beds. A survey made from the autumn of 1949 to the spring of 1951 disclosed that affected plants in autumn or winter had no primary roots or only short and distorted ones. Underwater parts of the stem were rotten and the plants lost anchorage and floated away. Typically there were only two or three roots, each only about 0·25 in. long, at each node and no secondary roots. They were swollen, curved, and brittle, features characteristic of 'crook root' [*Spongospora* sp.: *R.A.M.*, 32, p. 353]. From about April onwards anchored plants recovered. Secondary roots were produced profusely, but instead of being white and flexible were short (seldom over 0·25 in. long), creamy brown, and swollen near the tip.

Two distinct types of fungal body were found in the tissues of distorted roots and these are tentatively regarded as aggregates of zoosporangia and spore balls, and to belong to a member of the Plasmodiophorales. Zoosporangia preponderated in the distorted primary roots during autumn and winter, while spore balls were most common in the swollen tips of secondary roots in spring and summer.

Using affected primary roots as inoculum, plasmodia and zoosporangia were

produced in young primary roots developed from axillary shoots of healthy watercress. Before secondary rootlets could be developed in the laboratory it became necessary to exclude light from the underwater parts of plants which had already produced healthy primary roots. In secondary roots the same inoculum produced spore balls. Thus the two forms are different stages of the same fungus. Under laboratory conditions zoospores were liberated from the newly-formed roots of the test plants eight days after inoculation. The few days in which this cycle was completed accounts for the rapidity with which every part of a commercial bed may be attacked.

Andersen (A. L.) & DeZeeuw (D. J.). **Seed treatment studies for damping-off control in garden and canning Beans—report of progress.**—*Quart. Bull. Mich. agric. Exp. Sta.*, 34, 4, pp. 357–364, 1952.

The results are given of the experiments carried out from 1949 to 1951 inclusive, at the Department of Botany and Plant Pathology, Michigan State College, East Lansing, for improving stands of beans [*Phaseolus vulgaris*: cf. *R.A.M.*, 32, p. 602] by dry (dust) and slurry (water and methocel) seed treatments. Dust treatment consisted in shaking the beans with the powdered fungicide in a flask, paper bag, or envelope. The slurries were prepared by adding a few drops of a 7 per cent. methocel solution (methyl cellulose from Dow Chemical Company) or of water to the required amount of fungicide to obtain a soft paste.

Of the varieties tested Rival and Round Pod Kidney Wax stands were improved by seed treatment, the latter, however, being much more susceptible to damping-off [ibid., 29, p. 452] than most other varieties. It is now used as a standard variety for comparing fungicidal efficiency of new and old compounds. Of the 20 varieties tested in 1950 for susceptibility to damping-off 11 developed 25 per cent. or more, while the remainder, including Stringless Greenpod, Sure Crop Wax, Bountiful, U.S. No. 5 Refugee, Cherokee Wax, Contender, Florida Belle, Stringless Red Valentine, and Stringless Refugee, suffered little stand reduction.

The following fungicides were found to be effective seed protectants and are recommended: phygon XL, arasan, and C & C L-224 [loc. cit.], all at 4 oz. per 100 lb. seed, and ceresan M (2 oz.) only as a dust. Highly effective in one or two years were semesan (2 oz.), orthocide 406 (4 oz.), basic copper carbonate (4 oz.), agrox (2 oz.), tribasic copper sulphate (4 oz.), vancide 51 (4 oz.), cop-o-zinc (4 oz.), C & C L-640 (copper zinc chromate, 4 oz.), spergon (4 oz.), and panogen (3·2 oz. liquid).

Frandsen (N. O.). **Zur physiologischen Spezialisierung von Colletotrichum lindemuthianum (Sacc. & Magn.) Bri. & Cav.** [On the physiologic specialization of *Colletotrichum lindemuthianum* (Sacc. & Magn.) Bri. & Cav.]—*Z. PflKrankh.*, 60, 3, pp. 113–125, 6 figs., 1953. [English summary.]

At the Max Planck Plant Breeding Institute, Voldagsen, Western Germany, 12 monospore isolates of *Colletotrichum lindemuthianum* [see above, p. 613], representing 11 collections from a single experimental plot of beans (*Phaseolus vulgaris*), yielded nine distinct physiologic races and the corresponding number of morpho-types in pure culture on potato dextrose agar, three of which, however, exhibited only minor disparities in pathogenicity. Seven of the races differed from any previously recorded in Holland and Germany [cf. *R.A.M.*, 5, p. 645; 8, p. 349; 11, p. 618]. Cowpea and two varieties of *P. coccineus* were resistant and a primitive, small-seeded Argentine variety (So. No. 375) of *P. vulgaris* was highly resistant to all nine races. No changes in virulence occurred among the different races during the experimental period, and in two cases of depressed growth in culture vitality was fully restored by passage through bean pods.

Complicating factors in breeding for resistance to anthracnose include the abundant production of races of the pathogen (the underlying genetic cause of which has not yet been clearly demonstrated) and the corresponding complex genetic basis of resistance on the part of the host.

Antibiotics control plant diseases.—*Seed World*, 73, 1, p. 38, 1953.

In greenhouse and field trials at the Plant Industry Station [Beltsville, Maryland] streptomycin sulphate sprays (three applications at weekly intervals) gave good control of bean [*Phaseolus vulgaris*] halo blight [*Pseudomonas medicaginis* f.sp. *phaseolicola*: *R.A.M.*, 31, p. 468]. One application followed three days later by inoculation in the field resulted in 41 per cent. infection, which was reduced to 10 per cent. by a second spray, compared with 90 per cent. for the untreated. Two applications would probably be sufficient for practical farm use.

Pavgi (M. S.) & Thirumalachar (M. J.). **Angular black spot disease of Mung Beans.**—*Nature, Lond.*, 172, 4372, pp. 314–315, 2 figs., 1953.

An angular black spot disease observed on mung beans (*Phaseolus radiatus*) near Banaras, India, during September and October [? 1952] and the fungus associated with it were found to be identical with the disease on the same host attributed to *Synchytrium phaseoli* [*R.A.M.*, 28, p. 559]. Examination of the type material of the latter showed it to be a species of *Protomycopsis* with a warty exospore. The fungus is designated *P. patelii* n.nom.

Kernkamp (M. F.), Frosheiser (F. I.), & Gibler (J. W.). **Effect of seed treatment on yield and nodulation of Soybeans in Minnesota.**—*Plant Dis. Reptr*, 37, 4, pp. 222–225, 1953. [Multilithed.]

Greenhouse and field experiments confirmed the results of preliminary tests that soy-bean seed treatment with fungicides [cf. *R.A.M.*, 30, p. 266; 31, p. 220] increases stands, but not yields. In field soil devoid of *Rhizobium* spergon prevented nodulation though the seed was inoculated with *R. leguminosarum*; arasan had no effect [cf. ibid., 32, p. 69]. If soy-beans are sown in soil not previously producing this crop inoculation without chemical treatment is recommended.

Stubbs (L. L.). **Further host range and transmission studies with a virus disease of Carrot endemic in Australia.**—*Aust. J. sci. Res.*, Ser. B., 5, 4, pp. 399–408, 3 pl., 1952.

Insect transmission studies at the Plant Research Laboratory, Department of Agriculture, Burnley, Victoria, on the virus disease of carrots endemic in Australia [*R.A.M.*, 28, p. 435] established the virus as one distinct from any previously described, and the name 'carrot motley dwarf' is proposed. It was transmitted by the aphid *Cavariella aegopodii* to tobacco (Hickory Pryor and Early Virginia), *Petunia* (Rose of Heaven and Fluffy Ruffles), *Datura stramonium*, chilli, and *Nemesia*. Local necrotic feeding lesions, often with a chlorotic halo, appeared on older tobacco leaves after 8 to 13 days. Systemic symptoms, decreasing in severity with age, generally developed after 20 to 40 days, consisting of vein-clearing followed by vein necrosis on young leaves and later by severe blistering, distortion, and downward cupping of the lamina. On *Petunia* symptoms were most severe on young plants inoculated in winter: tan or buff necrotic ring and line patterns appeared (usually 15 to 18 days after inoculation) on the oldest leaves and progressed acropetally as these leaves shrivelled and died. On older plants primary feeding lesions, in the form of chlorotic blotches or slate- or buff-coloured necrotic areas, sometimes developed; systemic symptoms generally began as a light and dark green mottle, though necrotic shock symptoms were occasionally observed.

On *D. stramonium* necrotic or chlorotic feeding lesions were sometimes recorded.

Systemic vein-clearing, confined at first to segments of the young leaves, appeared in 14 to 16 days and was succeeded by a mosaic mottle on the young leaves, which later became distorted and cupped downwards. In four to six weeks stem constrictions developed, alternating with brown necrotic areas which split longitudinally to form cankers; the plants usually died. On chilli small, red, circular feeding lesions appeared on the older leaves 12 to 14 days after inoculation. A systemic light and dark green mottle, with slight blistering and distortion of the young leaves, developed about seven days later. Chlorotic rings appeared transiently on the older leaves. *Nemesia* displayed yellow or red vein-banding, with leaf distortion. Symptoms on all hosts except *D. stramonium* were masked by rising temperatures and intensified at low temperatures.

Successful transmissions were obtained when undiluted sap from infected *Petunia* plants was rubbed on to the leaves of young tobacco plants previously dusted with aloxite abrasive and when tobacco and *D. stramonium* were inoculated with infective tobacco sap. Virus activity appeared to be greater in *Petunia* sap than in tobacco extracts. In *Petunia* the highest virus concentration occurred in young, severely affected plants. Sap diluted with an equal volume of phosphate buffer (pH 7) produced a higher percentage of systemically infected tobacco plants than that diluted with buffer plus 0·1 per cent. sodium sulphite or with water. Infectivity was reduced, but not destroyed, when *Petunia* sap was diluted with an equal volume of sap from healthy or infected carrot leaves. Inoculations with undiluted carrot sap severely injured tobacco, even when the leaves were washed with water immediately afterwards. Carrot sap did not cause excessive injury to carrot leaves, nor did infection occur. Local lesions on mechanically inoculated tobacco leaves consisted of faint chlorotic rings, which appeared eight to ten days after inoculation. Systemic symptoms were milder than those resulting from aphid inoculations. The removal of older leaves from tobacco plants with mild symptoms intensified symptom expression on the younger leaves; topping intensified ring and line patterns on the older leaves. Mechanically infected *D. stramonium* plants were less dwarfed than those infected by aphids, but necrotic stem symptoms were of comparable intensity.

The virus could not be recovered in carrot from infected solanaceous hosts by mechanical or aphid inoculations. Preliminary work indicated that dodder (*Cuscuta polygonorum*, *C. campestris*, and *C. tasmanica*) linkage might be promising, infection being transmitted from diseased to healthy *Petunia* by this method. In graft transmission experiments between infected *Petunia* and healthy carrot two transmissions occurred, though graft unions were not secured.

Simons (J. N.) & Sylvester (E. S.). **Acquisition threshold period of western Celery mosaic virus for four species of aphids.**—*Phytopathology*, 43, 1, pp. 29–31, 1953.

At the Division of Entomology and Parasitology, University of California, Berkeley, experiments were performed to determine the acquisition threshold period of western celery mosaic virus [*R.A.M.*, 27, p. 459] for the aphids *Myzus persicae*, *Aphis apii*, *M.* [*Aulacorthum*] *solani*, and *M. circumflexus* [*A. circumflexum*]. None of the species succeeded in acquiring the virus in a five-second feeding period but all did so in one of ten seconds. *A. circumflexum* was the most efficient of the four vectors and *M. persicae* and *Aphis apii* the least. The existence of a vector–host plant compatibility factor is postulated to account for these discrepancies. The optimum acquisition feeding periods for *Aulacorthum circumflexum* and *A. solani* were 15 and 20 seconds, respectively; as regards the other species the results were inconclusive.

The adoption of the widely used and largely self-explanatory terms, 'acquisition threshold period', 'acquisition feeding period', and 'test feeding period', is proposed.

Davis (J. F.) & McCall (W. W.). **Occurrence of magnesium deficiency in Celery on the organic soils of Michigan.**—*Quart. Bull. Mich. agric. Exp. Sta.*, 35, 3, pp. 324–329, 1 fig., 1953.

Magnesium deficiency in celery was observed for the first time in Michigan in 1946. The disturbance, which occurs in most of the main celery-producing areas in the State, is characterized by the progressive mottling and yellowing of the tips, margins, and the interveinal areas of the older leaves. Necrotic areas appear later and often much of the blade becomes dead and dry. In control experiments carried out in 1952 at Muck Experimental Farm spray applications of magnesium sulphate (10 lb. per acre) at 10-day intervals throughout the growing season appeared to control the deficiency in Utah 10-B variety and to increase yield. Utah 10-B was the most susceptible variety whereas Summer Pascal was much less so, and Utah 15 showed no symptoms.

Calhoum Watermelon for wilt-infested soil.—*Seed World*, 73, 1, p. 28, 1953.

Calhoum, a new, early maturing watermelon variety developed in 1951 by the Louisiana Station, is reported to be excellent for soils infested with wilt [*Fusarium bulbigenum* var. *niveum*: *R.A.M.*, 27, p. 346; 32, p. 360].

Mishra (J. N.). **Ozonium wilt of Guar and cucurbit plants in Bihar.**—*Nature, Lond.*, 172, 4370, pp. 209–210, 1953.

A severe wilt of guar (*Cyamopsis psoraloides*) [*C. tetragonoloba*] was observed in several restricted areas of Bihar, India, during September, 1952, affecting 20 to 25 per cent. of the plants. Thick hyphal strands enveloping and girdling the shoots developed numerous chocolate brown sclerotia 1 to 1·5 mm. in diameter. The causal fungus was identical with *Ozonium texanum* var. *parasiticum* [see above, p. 641]. It also caused shoot wilt of squash in several localities.

Imazeki (R.). **Tricholoma aggregatum (Schaeffer ex Secretan) Costantin & Dufour and T. conglobatum (Vittadini) Saccardo.**—*Bull. For. Exp. Sta. Meguro* 57, pp. 141–150, 1 pl., 1 fig., 1952. [Received June, 1953.]

In order to mitigate the confusion which has existed hitherto regarding the taxonomy of the 'simezi' mushroom, highly prized in Japan for its gastronomic qualities, the author herein refers the two principal species to *Tricholoma aggregatum* and *T. conglobatum* [*R.A.M.*, 30, p. 97].

Chevaugeon (J.). **Recherches sur la cercosporiose de l'Arachide en Moyenne Casamance.** [Researches on cercosporiosis of Groundnut in Middle Casamance.]—*Ann. Inst. nat. Rech. agron.*, Sér. C (*Ann. Épiphyt.*), 3, 4, pp. 489–510, 4 diags., 1 graph, 1952.

In Middle Casamance, Senegal, infection of groundnuts by brown leaf spot, caused mainly by *Cercospora personata* but also occasionally by *C. arachidicola* [*R.A.M.*, 31, p. 274; 32, p. 90], is favoured by the prevailing weather conditions, i.e., a temperature without marked day and night variations (monthly average 26·6° to 31° C.) and high average atmospheric humidity with saturation over long periods. A statistical study of varietal susceptibility made on 20 oil-producing and 16 edible varieties demonstrated that among the former there is no more resistant variety than M'Bambey 28–206 being grown at present. M'Bambey 48–45, 48–55, 48–38A, 48–38, 42–67, 41–48, 37–59, 28–207, 28–219, and 28–227 were about equally resistant. Of the edible varieties tested, Rustembourg and M'Bambey 41–11 were more resistant than M'Bambey 28–206. There was no significant difference as regards susceptibility between erect and prostrate varieties.

Large-scale sowing should be completed as quickly as possible, or the last-sown

fields may become severely infected. The wider the spacing of the plants, the lower the incidence of infection, though with equal spacing double rows have slightly less infection than single. A complete fertilizer (10–14–18 at 150 kg. per ha.) was highly unfavourable to infection.

In sulphur dusting tests the evidence obtained demonstrated that the effect of any one application persisted for less than a fortnight. Treatments carried out on 10th October had no appreciable effect and those begun on 25th August were less effective than those started on 6th. Experiments should be made to test the effect of earlier dusting, begun at sowing or upon emergence, and of reducing the interval between the applications to 12 days.

BARRETT (H. C.). **A large-scale method of inoculating Grapes with the black rot organism.**—*Plant Dis. Reptr*, 37, 3, p. 159, 1953. [Multilithed.]

In connexion with breeding grape vines resistant to black rot (*Guignardia bidwellii*) [*R.A.M.*, 31, p. 275] at the Department of Horticulture, University of Illinois, Urbana, a simple method was developed for inoculating a large number of plants in the greenhouse. Recently infected leaves with numerous lesions and pycnidia were collected in polyethylene plastic bags. Small pieces of heavily infected leaf were placed in a Waring blendor in batches of 100 gm. tissue to 250 ml. distilled water and reduced after a minute or two to a mass of fine fibres. After standing for five minutes the suspension was filtered through cheesecloth. Plants were inoculated by spraying the spore suspension on the foliage until all parts were dripping wet, using a De Vilbiss No. 15 atomizer or a small paint spray gun attached to an air line under about 15 lb. pressure. Inoculated plants were enclosed for 48 hours in a chamber covered with moist muslin.

BLACK (L. M.). **Plant virus tumors.**—*Ann. N.Y. Acad. Sci.*, 54, 6, pp. 1067–1075, 2 figs., 1952.

The malignancy of plant tumour diseases is compared with that in animals [*R.A.M.*, 32, p. 424]. In plants there is no invasive growth or metastasis of tumours; plants are less vulnerable and have regenerative powers of growth which are lacking in most animals. It is suggested that the histogenic development of both should be considered comparatively.

Several virus diseases of plants are known in which leafy outgrowths are produced from the veins, e.g., wound tumour [clover big vein] virus [ibid., 32, p. 22 and next abstract], in connexion with which the author summarizes the available information. In addition to red clover 43 cultivated plants in twenty different families have been proved susceptible to the virus. The most constant symptoms of big vein are the irregular enlargement of the veins and woody tumours on the roots. The root tumours of sweet clover were found to originate in the pericycle opposite the primary phloem. Some stem tumours of sweet clover also originated in the pericycle, but in other plants there were some overgrowths from the cambium or the phloem of the leaf veins.

Pieces of tumour tissue excised from the roots of sorrel (*Rumex* [*acetosa*]) and grown in pure culture [ibid., 28, p. 507] doubled in volume about every three weeks. After 14 months the virus was demonstrated to be still present in the tissue. After 28 months a small root differentiated from the tissue. Some similarities between wound-tumour disease and mammary carcinoma of the mouse are pointed out.

BLACK (L. M.). **Occasional transmission of some plant viruses through the eggs of their insect vectors.**—*Phytopathology*, 43, 1, pp. 9–10, 1953.

At the Brooklyn Botanic Garden, New York, females of *Agalliopsis novella* reared on crimson clover plants harbouring wound tumour [clover big vein] virus [see preceding abstract] oviposited eggs which gave rise to about 1·8 per cent. of

infective progeny, while in an occasional individual the rate was much higher. Females of *Agallia constricta* reared on crimson clover infected by potato yellow dwarf virus [ibid., 26, p. 315] produced eggs that gave approximately 0·8 per cent. viruliferous progeny.

ZAUMEYER (W. J.). **Alfalfa yellow mosaic virus systemically infectious to Beans.**—*Phytopathology*, 43, 1, pp. 39–42, 1 fig., 1953.

This is an amplified version of the author's studies at the Plant Industry Station, Beltsville, Maryland, on a new strain of lucerne mosaic virus termed alfalfa [lucerne] yellow mosaic (*Marmor medicaginis* var. *flavovarians* n. var.) [cf. *R.A.M.*, 32, p. 606] causing systemic infection of beans (*Phaseolus vulgaris*) in Idaho, a note on which has already appeared [ibid., 32, p. 230]. Cowpea, [chilli] pepper (*Capsicum frutescens*), and *Petunia hybrida* remained immune in inoculation experiments. The inactivation period for the virus at 18° C. is here given as 96 hours [cf. loc. cit.]. The results of cross-protection studies indicate a relationship between alfalfa yellow mosaic, yellow patch [see next abstract], and yellow dot viruses.

THOMAS (H. R.) & ZAUMEYER (W. J.). **A strain of yellow Bean mosaic virus producing local lesions on Tobacco.**—*Phytopathology*, 43, 1, pp. 11–15, 1 fig., 1953.

Severe yellow mosaic virus, which induces pronounced epinasty, chlorosis, and vein necrosis in inoculated primary bean (*Phaseolus vulgaris*) leaves, followed by apical necrosis and death in some varieties and severe systemic mottle in others, was isolated from a bean plant in Idaho. Under natural conditions in the same State, Oregon, and Washington the virus is responsible for a reddish-brown blotching of the pods, sometimes accompanied by foliar mottling and stem necrosis. In tests at the Plant Industry Station, Beltsville, Maryland, it proved to be infectious to all the bean varieties used, except Great Northern U.I.16, 31, and 123, as well as to pea, soy-bean, broad bean, *Vigna sesquipedalis*, *P. aconitifolius*, *Cyamopsis tetragonoloba*, *P. acutifolius* var. *latifolius*, *Canavalia ensiformis*, *Melilotus alba*, crimson clover, and Ladino clover (*Trifolium repens* f. *giganteum*), and produced chlorotic lesions on Turkish tobacco, *Nicotiana rustica*, and *N. sylvestris*.

Severe yellow mosaic virus was inactivated between 50° and 55° C. in 10 minutes and at 18° in 48 to 72 hours. It withstood a dilution of 1 in 2,000 but not of 1 in 3,000. No cross-protection against severe yellow mosaic was conferred on beans or broad beans by the viruses of common bean mosaic, the necrotic lesion strain of bean yellow mosaic (abs. in *Phytopathology*, 42, p. 24, 1952), Ladino clover yellow patch [strain of lucerne mosaic: *R.A.M.*, 29, p. 29, and preceding abstract], tobacco ring spot [ibid., 32, p. 464], southern bean mosaic, and a strain of cucumber mosaic, indicating that severe yellow mosaic virus is an independent entity. However, on the grounds of similarity in properties and particularly of host range and symptomatology on beans, it is classified as severe yellow mosaic strain of bean yellow mosaic virus.

RAYCHAUDHURI (S. P.). **Studies on Bayberry yellows.**—*Phytopathology*, 43, 1, pp. 15–20, 1 fig., 1953.

The virus responsible for a yellows-type disease of bayberry (*Myrica caroliniensis*) [*M. pensylvanica*, the berries of which yield a wax] at Pemberton, New Jersey, appears to be distinct from any previously described and is designated *Chlorogenum myricae* n.sp. or bayberry yellows virus. At the Rockefeller Institute for Medical Research, New York, it was shown to be transmissible by cleft-grafting and through the agency of dodder (*Cuscuta campestris* and *C. subinclusa*), but not by sap, by ten

species of leafhoppers, or through the seed of its own host, *Vinca rosea*, and dodder. It was communicated to the following species (besides those already mentioned): carrot, beet, *Petunia hybrida* var. *nana compacta*, Burpee's Fordhook celery, *Tagetes signata* var. *pumila*, and onion, causing typical yellows on all except dodder, which reacted by a reduction in [stem] diameter to a third or half the normal size. The virus was apparently retained for a period of 14 months in dodder growing on healthy asters, which are immune from infection. In *V. rosea* the disease was cured by exposure for six days to a temperature of 41·5° to 42° C. [cf. *R.A.M.*, 31, p. 332].

Report of the Minister of Agriculture for Canada for the year ended March 31, 1953. —143 pp., 1953.

In the section of this report [cf. *R.A.M.*, 31, p. 52] dealing with forest investigations, it is stated that progress is being made in the study of *Flammula connissans*, recently identified as the cause of root- and butt-rot of spruce. Comparative studies of 16 isolates of *Fomes annosus* [ibid., 31, p. 93] from North America and Europe have so far failed to indicate the existence of distinct geographical forms.

During a study of red stain of lodgepole pine [*Pinus contorta* var. *latifolia*] in Alberta, it was found that 84 per cent. of the trees in five $\frac{1}{10}$-acre plots had red stain and decay associated with *F. pini* [ibid., 32, p. 520], *Polyporus anceps*, *Stereum pini* [loc. cit.], and *S. sanguinolentum* [loc. cit.]. The decay causes serious losses in the timber taken from such trees.

In Saskatchewan the 'red-patch' disease of spruce in nursery seed-beds is now known to be associated with a snow-mould [unspecified], control of which is practicable.

In the Maritime Provinces the strangulation of the roots of yellow birch trees by wire was followed by the disappearance of mycorrhiza, the death of affected roots, and their invasion by saprophytic fungi. An increase in the number of dead root tips was correlated with a decline in crown condition. Evidence from studies in Ontario showed that the typical morphology of mycorrhiza is caused by growth substances produced by the mycorrhizal fungi.

In the Field Crops section (pp. 24–33) it is reported that race 15B of *Puccinia graminis* [ibid., 32, p. 543] was found in all the provinces except Prince Edward Island. At least two sub-strains of this race may be distinguished on the basis of pathogenicity to certain durum wheats. During a survey in August, 1952, it was found that root diseases of wheat were very prevalent in the Prairie Provinces. An average of 36 per cent. of the plants bore lesions of *Helminthosporium sativum* and *Fusarium culmorum* [ibid., 31, p. 50] on the leaf bases or stems, causing a yield loss estimated at 7 per cent. High temperatures are believed to affect wheat varieties with shallow crowns, making them more susceptible to root-rot.

Streak mosaic of wheat [strain of wheat mosaic virus: see below, p. 674] was found for the first time in June, 1952, in areas where winter wheat is regularly grown. In severe cases 70 to 100 per cent. of the plants were infected.

In a microbiological approach to the control of *H. sativum* in the soil, it was found that the addition of organic material, especially soy-bean meal, stimulated the germination of the conidia, with subsequent lysis of the germ-tubes. Certain organisms antagonistic to root-rot fungi *in vitro* were not effective in protecting seedlings when seeds soaked in cultures of the organisms were sown in natural soil.

Cereal smut surveys have shown an increase in barley loose smut [*Ustilago nuda*: ibid., 31, p. 52]. In 1952 the variety Valki, previously resistant, was attacked by three different races. Further tests, at Edmonton and Saskatoon, have shown that loose smut may be controlled [loc. cit.; ibid., 32, p. 550] by soaking affected seed in 0·2 per cent. suspension of spergon for 48 hours, or in water only for 56 to 90 hours at 70° to 77° F.

In greenhouse tests the barley varieties Anoidium, Rabat, Prospect, Velvon II, and Comfort revealed a high degree of tolerance of *H. sativum* [see below, p. 667].

Lucerne bacterial wilt [*Corynebacterium insidiosum*: ibid., 32, p. 66] developed rapidly in southern Alberta as a result of the abnormally wet season. The results of infection tests suggest that there may be different strains of the wilt organism. Samples of lucerne pod debris from diseased plants proved infective, but cleaned seed from the same plants did not transmit the disease. In tests of 98 clonal lines of Grimm lucerne one was found to be highly resistant.

Boron deficiency of red clover was observed in Quebec; the symptoms included the production of abnormal undifferentiated tissue in place of the normal cambium and phloem, and the absence of newly-formed thin-walled xylem vessels. An application of sodium molybdate to clover seed improved yields in a test at Charlottetown in 1952. At the end of four months the green weight of herbage on plots sown with treated seed was more than double that where no molybdenum was applied.

Eight physiologic races of flax rust [*Melampsora lini*: ibid., 32, p. 63] were isolated from 60 collections obtained from Eastern Canada and the Prairie Provinces. Dakota proved susceptible to five of the races and immune from three [loc. cit.], but 93 per cent. of the rust isolates were pathogenic to it. The resistant varieties Rocket, Sheyenne, Marine, and Redwood, comprising 55 per cent. of Manitoba's flax acreage, were immune from all the races identified. None of the 375 new flax varieties tested for pasmo [*Sphaerella linorum*: ibid., 31, p. 433] reaction showed a very high degree of resistance.

Pod and stem blight of soy-bean [*Diaporthe phaseolorum* var. *sojae*: ibid., 32, p. 63] is as destructive as stem canker [*D. p.* var. *batatatis*: loc. cit.] and both diseases significantly reduce yields, especially of late-maturing varieties, in Ontario.

It was established that races A, B, C, D, BC, and BD of potato blight [*Phytophthora infestans*: ibid., 32, p. 543] exist in the Maritime Provinces. The Keswick and Canso varieties are immune from races A, B, C, and BC, but susceptible to D [ibid., 32, p. 368] and BD. Bordeaux mixture was the most effective fungicide in controlling both foliage and tuber blight, followed closely by cop-o-zink.

Some potato varieties, such as Houma, are highly resistant to *Verticillium* wilt [*V. albo-atrum*: cf. ibid., 31, p. 628], while Green Mountain, Katahdin, and Keswick are susceptible to soil-borne inoculum, but disseminate the pathogen only slightly by means of mycelium within the tubers. Irish Cobbler, Sebago, Chippewa, and Kennebec are susceptible and readily disseminate the pathogen.

During an investigation of the microbiological control of potato scab [*Actinomyces scabies*: ibid., 32, p. 97] a trend towards greater numbers of bacteria and fungi was noted in soils with a higher scab rating. The incidence of the various nutritional groups of fungi did not follow any pattern that could be correlated with percentage scab, in contrast to work at St. Catherines and Guelph, which indicated that the incidence of bacteria requiring amino acids was inversely related to the degree of scab.

Further studies at Fredericton on potato virus diseases [ibid., 32, p. 63] have shown that Katahdin and Warba, which react severely in the greenhouse, possess a high degree of field resistance to potato virus Y. Green Mountain, Irish Cobbler, Epicure, and Keswick are field susceptible. Regular applications of DDT reduced greatly the aphid population on Green Mountain but not the spread of virus Y, suggesting that the level of initial infection in the seed pieces and the type and activity of aphids have more bearing on spread than the total number of aphids. The disease may be spread by viruliferous aphids that feed briefly, since it has been shown in New Brunswick that the peach aphid [*Myzus persicae*] transmitted potato virus Y after feeding on infected plants for 10 seconds or less, whereas

after more than an hour's feeding it was unable to transmit the virus to healthy plants [ibid., 32, p. 402]. Of 609 potato seedlings tested for resistance to scab, 91 showed satisfactory resistance. Of 715 tested for resistance to viruses X and Y, 86 were highly resistant. Nine of 71 seedlings tested for resistance to leaf roll [ibid., 32, p. 445] have shown no symptoms under field conditions for six years.

The average weight of sugar beet tissues rotted by *Phoma betae* [cf. ibid., 32, p. 4] and *Pythium ultimum* [cf. ibid., 32, p. 160] was several times greater in wilted pieces than in turgid ones from the same beets. In turgid beets storage in a high humidity increased *P. ultimum* infection and decreased *Phoma betae*.

Violet root rot (*Rhizoctonia crocorum*) [*Helicobasidium purpureum*: ibid., 30, p. 307] threatens to become a limiting factor in the production of carrots and celery at Thedford, Ontario. Infection takes place between 10° and 30° C. and at pH 6.

Greenhouse cucumbers have recently been severely attacked by powdery mildew [*Erysiphe cichoracearum*: cf. ibid., 31, p. 564], which is effectively controlled by repeated applications of copper sulphate or iscothan.

A tomato line, P.I. 163246, was found to show resistance equal to the selection Geneva T-5, itself highly resistant to late blight [cf. ibid., 32, p. 155] under field and greenhouse conditions. In a survey to assess the influence of *Verticillium* wilt [*V. albo-atrum*: ibid., 26, p. 440] on tomatoes in British Columbia, 55 per cent. of the plants were found to be affected. In selected plots fruit reduction was 12 per cent., the loss over the whole area being estimated at 6·6 per cent.

Turnip mosaic virus in swedes [ibid., 31, p. 363] reduced the yield by half in plots in Nova Scotia. Raising stecklings in isolated fields gives good control; those showing virus symptoms failed to produce seed in the greenhouse. A common weed in the area, *Raphanus raphanistrum*, is frequently affected by a mosaic mottle. Mosaic in swedes, as it occurs in Canada, may be caused by turnip virus 1 [turnip mosaic virus] acting alone or in combination with other viruses.

In the section devoted to fruit crops (pp. 34–39) it is reported that good control of apple scab [*Venturia inaequalis*: ibid., 32, p. 63] was obtained in spray trials in Nova Scotia by using crag [341] and ferbam. The selection of fungicides in accordance with their protectant or eradicant action and their use in relation to Mills's chart for infection periods are having a strong influence on scab control in commercial orchards. In Quebec in 1952 weather conditions were very favourable for scab development; ferbam gave best protection to the fruit and crag 341 good control. Observations for five years have failed to reveal differences in fruit production caused by these fungicides. Of the eradicant fungicides tested at St. Catherines, Ontario, tag, velsicol, and phygon were effective against foliage infection. Among the protectant fungicides, magnetic 70 and consul 40 sulphur pastes gave outstanding results. Orthocide [406 = captan: see below, p. 685] gave good control, while phygon (followed by ferbam), crag 341, and nirit were effective. In the experimental orchard in the Creston area, British Columbia, a four-spray schedule (pink, calyx, first, and second cover) of captan gave 98 per cent. clean fruit, crag 341 gave 94, ferbam, 93, phenyl mercury acetate (first two) and crag (cover), 92, phenyl mercury chloride (first two) and crag (cover), 91, ferbam plus wettable sulphur, 87, and lime sulphur, 69 per cent.

Progeny from crosses involving the apple varieties Antonovka and McIntosh, resistant to crown rot [*Phytophthora cactorum*: ibid., 30, p. 404], and the susceptible Winter St. Lawrence and Yellow Transparent were inoculated with the crown rot pathogen. The disease rating for plants with susceptible parents was 87 (maximum 100); for those with one resistant parent, 19; and for those with both parents resistant, 5.

Leafhoppers [unspecified] transferred little cherry virus [ibid., 31, p. 54] from cherry to cherry and China aster, inducing in the latter symptoms similar to those caused by aster yellows virus.

Control of 'leaf blotch' of fruit trees, a physiological condition caused by magnesium deficiency [ibid., 30, p. 16], in British Columbia was obtained by the application of four or more sprays of magnesium sulphate (2 per cent.) during June and July. Soil treatment with magnesium salts was ineffective. *Verticillium albo-atrum* was serious in a strawberry field in Nova Scotia, where potatoes had been cropped previously for three successive years.

Monilinia vaccini-corymbosii [*Sclerotinia vaccinii-corymbosi*: cf. ibid., 32, p. 87] causes twig and blossom blight of native blueberries in Nova Scotia and New Brunswick. The disease was more prevalent in fields bearing their second or third crop than in those producing their first. It is reduced by burning the bushes.

A single application of Bordeaux mixture when new growth was at the two- to three-leaf stage gave fairly good control of vine dead-arm disease [*Cryptosporella viticola*: ibid., 31, p. 54].

Several chrysanthemum varieties have exhibited yellow streaking or mottling of the leaves, stunting, and lack of vigour, suggestive of virus infection. Grafting experiments with mistletoe have shown that at least two viruses appear to be present.

The genetic connexion between *Botrytis cinerea* and *Botryotinia* [*Sclerotinia*] *fuckeliana* was confirmed [cf. ibid., 28, pp. 490, 547; 32, p. 416].

Wheat breeding work in the Cereals Division (pp. 76–80) has been directed mainly towards a variety resistant to race 15B of *Puccinia graminis*. So far the most promising one developed at the Laboratory of Cereal Breeding, Winnipeg, is C.T. 186, from the cross (McMurochy × Exchange) × three successive back-crosses with Redman. In Manitoba C.T. 186 is outstanding in yield and in resistance to lodging, stem rust, and bunt [*Tilletia* spp.: ibid., 31, p. 428], as well as showing considerable resistance to leaf rust [*P. triticina*: ibid., 32, p. 471] and loose smut [*Ustilago tritici*: cf. ibid., 32, p. 542]. C.T. 186 was increased in California and Arizona during the winter of 1952–3 to produce enough seed for extensive sowing in the spring of 1953.

A selection from the oat variety Garry is resistant to Victoria blight [*Helminthosporium victoriae*: ibid., 31, p. 52], all races of *P. graminis*, both smuts [*U. kolleri* and *U. avenae*: ibid., 31, p. 427], and a number of races of crown rust [*P. coronata*: cf. ibid., 31, p. 549], and outyields the original Garry. Investigations by the Laboratory of Plant Pathology, Winnipeg, revealed a hitherto unreported race of oat stem rust [ibid., 31, p. 52], designated race 7A.

In testing barley strains for resistance to *H. sativum* [ibid., 31, p. 596] a large number of selections from the F_4 of Rabat × Vantage had much more resistance than Rabat [see above, p. 665].

Tobacco varieties resistant to black root rot [*Thielaviopsis basicola*: ibid., 31, p. 259] developed in Ontario are Jamaica Wrapper, Hicks, Three Sucker, and Virginia Gold. In Massachusetts Havana K1 is fairly resistant to black root rot, but is moderately susceptible in Ontario.

Dwarf bunt of winter wheat, *Tilletia brevifaciens* [ibid., 32, p. 471], was found to occur in two new locations, Omemee and Belleville, Ontario.

The rest of the information of plant pathological interest in this report has been dealt with from other sources [ibid., 32, pp. 518, 541, *et passim*].

Plant diseases. Virus diseases of Strawberries. Sooty moulds. Seed-borne diseases of Potatoes.—*Agric. Gaz. N.S.W.*, 63, 6, pp. 320–325, 11 figs., 1952.

Two of the major diseases of strawberries in New South Wales are caused by the crinkle [*R.A.M.*, 30, p. 99] and yellow edge viruses [cf. ibid., 29, p. 571]. Purchased runners should be closely scrutinized as many stocks on the market are infected.

The principal seed-borne diseases of potatoes in New South Wales are listed with notes [ibid., 32, pp. 235, 584]. They include the wilts caused by *Fusarium* [spp.:

ibid., 20, pp. 340, 593] and *Verticillium* [*albo-atrum*: loc. cit.; ibid., 23, p. 94], and bacterial wilt or brown rot [*Pseudomonas solanacearum*: ibid., 26, p. 123; C.M.I. map No. 138]. Control measures are described. In general, the seed tubers grown on the tablelands are healthier than those on the coast.

Plant diseases. Brown spot of Passion Fruit. Malnutrition diseases of plants.—*Agric. Gaz. N.S.W.*, 63, 7, pp. 373–376, 6 figs., 1952.

Brown spot of passion fruit caused by *Alternaria passiflorae* seriously restricts yields of commercial plantings in New South Wales [*R.A.M.*, 25, p. 100]. Vines should be planted far enough apart to permit as much open growth as possible, and trained systematically to facilitate subsequent pruning. In addition to the spraying schedules already given [loc. cit.; ibid., 21, p. 364] fortnightly applications of 4–4–50 Bordeaux mixture are recommended for adequate coverage during unusually wet summer periods when growth is rapid. Infected leaves should be removed immediately they appear. In areas where spraying is impracticable particular attention should be paid to pruning and training, so that dense masses of crowded foliage are avoided.

The trace elements known to be unavailable to plants in various parts of New South Wales are tabulated together with the crops affected and recommended corrective treatments [cf. ibid., 32, p. 508].

Plant diseases. Club root of Cabbages and related plants. Witches' broom of Lucerne.—*Agric. Gaz. N.S.W.*, 63, 9, pp. 494–497, 4 figs., 1952.

Although club root (*Plasmodiophora brassicae*) has not yet spread to all the important crucifer-growing areas in New South Wales [*R.A.M.*, 29, p. 496], up to 50 per cent. infection was recorded recently in a cauliflower crop at Windsor, following deposition of infested soil by floods.

Lucerne witches' broom virus is very prevalent throughout the low rainfall areas of the State [ibid., 31, p. 125]. Throughout the Riverina and western slopes and plains four- to five-year-old fields usually show 20 to 25 per cent. infection and stands over seven or eight years old, 60 to 70 per cent. At present control is limited to the eradication of diseased plants.

Plant diseases. Entyloma leaf spot of English Marigold. Late or Irish blight of Potatoes. Peach leaf curl. Shot hole of stone fruits.—*J. Dep. Agric. W. Aust.*, Ser. 3, 1, 4, pp. 501–502, 505–508, 4 figs., 1952.

R. F. Doepel reports that in 1951 a new disease (*Entyloma calendulae*) appeared on English marigold (*Calendula* [*officinalis*]) in several localities in Western Australia, including Perth, Forestfield, and Bindoon. Pale yellow spots, enlarging to $\frac{1}{4}$ in. in diameter and becoming dark grey, develop first on older leaves, which are often destroyed in wet weather. Younger leaves are infected later in the season; the plant appears ragged and produces inferior blooms. Control consists in growing plants on different sites each year, applying copper-containing sprays such as cuprox or soltosan as soon as symptoms appear and repeating at weekly intervals if necessary, and burning diseased plants and fallen leaves at the end of the season.

It is reported by W. P. Cass Smith that serious outbreaks of potato blight (*Phytophthora infestans*) [C.M.I. map No. 109; *R.A.M.*, 32, p. 236] are liable to occur in districts around Perth, from August to mid-November.

Peach leaf curl (*Taphrina deformans*) [C.M.I. map No. 192] is common in Western Australia in spring and early summer, attacking nectarines, almonds, and apricots, as well as edible and flowering peaches. A single spray with 1–10 lime sulphur or 6–4–50 Bordeaux applied at any time during the dormant period gives effective control [cf. *R.A.M.*, 30, p. 332].

Shot hole (*Clasterosporium carpophilum*) [see below, p. 681], occurring annually on stone fruits, is controlled [cf. ibid., 28, p. 462] by spraying at early pink bud with 6–4–50 Bordeaux plus ½ lb. calcium caseinate spreader to every 50 gals. If a second spray is necessary, 1–100 lime sulphur plus spreader at the same rate may be applied after fruit set to peaches, almonds, and plums in cool weather, and Bordeaux 2–3–50 plus spreader to apricots. An additional application of Bordeaux 6–4–50 before leaf fall may be beneficial.

Lawrence (E.). **Report of the Acting Director of Agriculture.**—*Rep. Dep. Agric. Nyasald, 1949*, 23 pp., 1951.

In the plant pathology section (pp. 17–23) of this report [cf. *R.A.M.*, 28, p. 271 and next abstract] P. O. Wiehe states that 328 diseases previously unrecorded in Nyasaland were observed during an extensive survey. Among the more important were *Alternaria* leaf spot [cf. ibid., 31, p. 44], ? bean mosaic virus [C.M.I. map No. 213], and rust (*Uromyces appendiculatus*) [cf. *R.A.M.*, 25, p. 439] on bean (*Phaseolus vulgaris*); smut (*Tolyposporium penicillariae*) [C.M.I. map No. 150] and rust (*Puccinia penniseti*) [ibid., No. 225] on *Pennisetum typhoides*; mosaic and brown streak viruses on cassava [*R.A.M.*, 28, p. 271]; anthracnose (*Glomerella cingulata*) [ibid., 29, p. 89], dieback (associated with a *Phoma*) and ring blotch virus [loc. cit.] on citrus; coffee anthracnose (*Colletotrichum coffeanum*) [*Glomerella cingulata*: ibid., 31, p. 173]; mildew (*Oidium* sp.) and mosaic virus [cf. ibid., 30, p. 135] on cowpea; *Armillaria mellea* [C.M.I. map No. 143] on *Araucaria angustifolia*, *Acacia mollissima*, and *Callitris* sp., new host records for Nyasaland; *Diplodia pinea* [*R.A.M.*, 29, p. 89] on *Pinus montezumae* and *P. radiata*; groundnut rosette virus [C.M.I. map No. 49]; early blight (*Alternaria solani*) [ibid., No. 89] and wilt (*Xanthomonas* [*Pseudomonas*] *solanacearum*) [ibid., No. 138] on potato; *Piricularia oryzae* [ibid., No. 51] and *Sporodesmium bakeri* on rice; sesame mildew (*Sphaerotheca fuliginea*) and wilt (*Fusarium oxysporum*) [*R.A.M.*, 30, p. 78]; head smut (*Sphacelotheca reiliana*) of sorghum [ibid., 31, p. 320], maize [ibid., 31, p. 536], and *Cleistachne sorghoides*; sugar-cane brown spot (*Cercospora longipes*) [ibid., 26, p. 145] and mosaic virus [ibid., 31, p. 143]; maize streak virus on sugar-cane and maize; sweet potato mosaic virus [ibid., 32, p. 64] and leaf spot (*Curvularia geniculata*); and tobacco mosaic virus [ibid., 30, p. 79] and brown spot (*Alternaria longipes*) [C.M.I. map No. 63].

A section (pp. 21–23) is devoted to the results of investigations on tung (*Aleurites montana*) diseases [*R.A.M.*, 32, p. 650], particularly die-back caused by *Botryosphaeria ribis* [ibid., 32, p. 524 and next abstract]. Systematic inspection of orchards for the detection of diseased branches is recommended.

Gillman (H.). **Report of the Acting Director of Agriculture.**—*Rep. Dep. Agric. Nyasald, 1950*, 36 pp., 1952.

In the plant pathology section (pp. 24–32) of this report [cf. preceding abstract] P. O. Wiehe lists a number of new disease records on cultivated plants in Nyasaland, including *Botryosphaeria ribis* [loc. cit.], causing die-back of apple [*R.A.M.*, 23, p. 393], avocado [ibid., 31, p. 132], guava [ibid., 18, p. 784], and *Grevillea robusta*; *Septoria gerberae* on *Gerbera jamesonii* [ibid., 30, p. 309]; *Xanthomonas campestris* [C.M.I. map No. 136], *Alternaria brassicae* [*R.A.M.*, 29, p. 89], and *A. brassicicola* [cf. ibid., 32, p. 118] on cabbage; *A. dauci* on carrot [ibid., 29, p. 31; 31, p. 563]; *Cercospora cruenta* on cowpea [ibid., 30, p. 263]; *C. cucurbitae* on cucumber [ibid., 32, p. 118]; *Dahlia* mosaic virus [C.M.I. map No. 116] on *D. variabilis*; *Puccinia pelargonii-zonalis* on *Pelargonium zonale* [*R.A.M.*, 29, p. 89]; *C. olitorius* on jute; *C. longissima* on lettuce [ibid., 27, p. 158; 29, p. 144]; *Mycosphaerella citrullina* on *Luffa cylindrica* [cf. ibid., 5, p. 136]; *Diplodia macrospora* on maize [C.M.I. map

No. 227]; *Oidium mangiferae* on mango [*R.A.M.*, 21, p. 31; 31, p. 563]; *Helminthosporium sativum* on oats [cf. ibid., 30, p. 603], rye [ibid., 27, p. 158], and wheat [ibid., 29, p. 408; 32, p. 117]; *Ovulariopsis papayae* [ibid., 29, p. 89] and an [unspecified] virus disease causing yellowish green mottling, puckering, and reduction in size of the leaves, and death of the growing point followed by the production of numerous suckers on papaw; *Phoma insidiosa* [ibid., 9, p. 506], *Gibberella zeae* [cf. ibid., 29, p. 411], *C. sorghi* [ibid., 23, p. 410], *C.* (?) *vaginae*, and *Didymosphaeria* sp. on sorghum; tobacco (?) rosette virus on tobacco [ibid., 31, p. 225]; and *Cladosporium fulvum* on tomato [C.M.I. map No. 77].

In studies on tung (*Aleurites montana*) diseases [see preceding abstract] various symptoms believed to be associated with [unspecified] deficiencies [cf. *R.A.M.*, 28, p. 271] were observed, including 'internal spotting', 'marginal corrosion', 'silvery spot', 'interveinal bronzing', and 'translucent spotting'. A species of *Mycosphaerella*, quite distinct from *M. aleuritidis* [ibid., 30, p. 551], caused leaf spot. The pycnidial state, *Dothiorella gregaria*, of *Botryosphaeria ribis* [see preceding abstract] was repeatedly obtained on the bark of recently killed shoots and in culture on sterile twigs. Asci and pycnidiospores were observed in the same stroma. In germination tests a large proportion of pycnidiospores were viable even after ten months. Of 21 isolates which had reacted positively on inoculation, three were non-chromogenic in culture, the others producing a colour reaction varying from greenish to reddish-yellow, indicating that pathogenicity of *B. ribis* is not always related to chromogenesis [cf. ibid., 4, p. 178]. In control experiments at the Tung Experimental Station a mixture consisting of beeswax, paraffin wax, gear oil, and Bordeaux mixture was satisfactory as a wound dressing for use after pruning, though not very economical. Sunscorch, which is common and serious in Nyasaland, affects the bark seven days after shade removal, lesions developing only on the north-west side of the trunk. The dead bark is easily penetrated by parasitic fungi. Artificial protection of the bark may be effected by lime-washing at intervals for about three months or with straw, treated with an insecticide against termites.

Chambers (P. C.). **Annual Report of the Department of Agriculture, Cyprus, for the year 1952.**—16 pp., Nicosia, 1953.

On p. 14 of this report [cf. *R.A.M.*, 29, p. 12] it is stated that Malaga vines growing on highly calcareous soil in Vosa and elsewhere often become strongly chlorotic and perish, whereas local varieties are less susceptible. Attempts to cure this by the application of a strong solution of ferrous sulphate to the pruning wounds have proved successful.

Symptoms suggestive of magnesium deficiency have been observed on lemon trees [cf. ibid., 27, p. 520; 32, p. 429] in Lapithos; the leaves have a low magnesium content. Stem rust (*Puccinia graminis*) [ibid., 31, p. 109] was severe [on wheat] in the central plain and resulted in severe loss of yield. Yellow rust (*P. glumarum*) [loc. cit.] occurred early in the season and the reduced leaf area resulted in loss of yield. An attack of blight (*Phytophthora infestans*) [ibid., 11, p. 670] on spring potatoes caused considerable losses except to growers who sprayed in time with knapsack sprayers issued on loan and saved their crops.

Mandell (J. D.) & Eisenstark (A.). **Factors affecting plaque formation by Xanthomonas pruni bacteriophage.**—*Phytopathology*, 43, 1, pp. 27–29, 1 fig., 1 graph, 1953.

At the Oklahoma Agricultural and Mechanical College, Stillwater, the plaques formed by the bacteriophage of *Xanthomonas pruni* [*R.A.M.*, 31, p. 423] decreased in size with rising concentrations of plating bacteria, increased in the presence of sodium chloride in the plating medium at the highest rate permitting host growth (3 per cent.), decreased at incubation temperatures exceeding 27° C., and ceased

at 33°, though this temperature is well below the inactivation temperature of the phage.

Graham (A. F.). **The viruses as nucleoproteins.**—*Canad. J. med. Sci.*, 31, 3, pp. 279–289, 1953.

The author reviews and discusses recent work (77 references) on the biochemical aspects of bacteriophages, including genetical studies.

Kelman (A.). **The bacterial wilt caused by Pseudomonas solanacearum.**—*Tech. Bull. N. C. agric. Exp. Sta.* 99, 194 pp., 10 figs., 3 maps, 1953.

This is a very full review of the literature on the bacterial wilt caused by *Pseudomonas solanacearum* [*R.A.M.*, 32, p. 594 *et passim*] which has accumulated since the first description of the bacterium in 1896. The work is divided into sections on early history, economic importance, distribution [C.M.I. map No. 138], host range, symptomatology, etiology, host–parasite relations, methods of dissemination, environmental influence, techniques employed in connexion with the pathogen, and control methods. There is a bibliography of 36 pages.

Sternheimer (Elizabeth P.). **Effects of X-irradiation on the growth of certain plant tissues in vitro.**—*Diss. Abstr.*, 13, 3, p. 293, 1953. [Lithoprinted.]

At the University of Michigan strains H_{13} and P_2 of sunflower crown gall [*Bacterium tumefaciens*: *R.A.M.*, 32, p. 547] tumour tissue showed sensitivity to X-irradiation below 500 r; growth almost ceased at 5,000 r [ibid., 32, p. 178]. Irradiation at 500 and 1,000 r progressively reduced the growth rate, the effects becoming marked after 10 days. As irradiation damage was not limited to auxin destruction the addition of a growth substance did not restore normal growth.

Ciferri (R.) & Ciferri (Fiorella). **Defectos y alteraciones del Cacao en granos.** [Defects and alterations in Cacao beans.]—*Mater. Veg., Den Haag*, 1, 2, pp. 148–166, 1953.

As the result of a comprehensive study of conditions prevailing chiefly in cacao belts around the Caribbean Sea, notes are given on the grading of cacao beans, their appearance when healthy, and the symptoms, cause, importance, and control of deterioration due to defects and alterations of the husks and cotyledons (due mostly to insects and mechanical damage), both in outward appearance and of the inside when cut lengthways.

Tozzetti (G. T.). **True nature, causes and sad effects of the rust, the bunt, and smut, and other maladies of Wheat and of Oats in the field.**—*Phytopath. Class.* 9, American Phytopathological Society, Ithaca, 139 pp., 3 pl., 1952. 17*s.* 6*d.*

This is the first English edition of the phytopathological writings of Targioni Tozzetti (translated by L. R. Tehon), comprising Part V of the 'Alimurgia' published in Florence in 1767. This chapter describes the maladies of cereals and was, in fact, the first treatise on plant pathology. Targioni affirmed that all the diseases he described were due to parasitism of microscopic vegetable organisms, and among the numerous parasites described it is possible to identify 32 common species.

Guyot (L.) & Massenot (M.). **Dix ans d'expérimentation sur la rouille noire des céréales (1941–1950).** [Ten years of experimentation on black rust of cereals (1941–1950).]—*Ann. Inst. nat. Rech. agron.*, Sér. C (*Ann. Épiphyt.*), 3, 3, pp. 351–391, 1952.

This paper on *Puccinia graminis* in France has already been noticed from another source [*R.A.M.*, 32, p. 121].

Jones (G. L.). **Inheritance of the mode of reaction to stem rust, particularly race 15B, and leaf rust in two crosses of vulgare Wheats.**—*Diss. Abstr.*, 13, 2, pp. 156–157, 1953. [Lithoprinted.]

As none of the commercial wheat varieties was resistant to race 15B [*R.A.M.*, 32, p. 543 and above, p. 664] in the 1950 epidemic of stem rust (*Puccinia graminis*) [ibid., 30, p. 220], a study was made at the University of Minnesota of the mode of inheritance of field and seedling reaction to this and other races and also to leaf rust [*P. triticina*: ibid., 32, p. 369 and next abstract]. Two of the parents, II–44–22 and II–44–29, selected from Mida × Kenya 117A and Kenya 58 × Newthatch, respectively, resisted 15B at all temperatures in the greenhouse and a collection of races in the field, but were susceptible to leaf rust. Frontana, the common parent in these crosses, was moderately susceptible to stem rust race 15B but resistant to several races of leaf rust.

On the basis of F_2 results in the greenhouse seedling reaction to the 'Abercrombie' isolate of 15B appeared to be controlled by a single gene, but seedling studies of the F_4 indicated that inheritance was more complex. The hours of sunlight appeared to increase the number of resistant plants or lines. Seedling reaction of the Kenya-derivative parents and the progeny of their crosses with Frontana was influenced greatly by light and temperature. Seedling resistance was conditioned by three independent genes in both crosses, though different gene interactions occurred in each cross.

In studies of seedling reaction to a mixture of cultures of race 15B some biotypes were apparently more pathogenic than the 'Abercrombie' isolate. Seedling reaction to each of the races 11, 17, 36, 38, and 56 of *P. graminis*, and to races 5 and 15 of *P. triticina* appeared to be simply inherited. It is possible that the leaf rust resistance of Frontana could be combined with both seedling resistance to certain races of *P. graminis*, including 15B, and field resistance to a collection of races.

Leaf tip necrosis was associated with reaction to race 15B and the resistance of the Kenya derivatives under conditions of high temperature and high light intensity. Browning reaction occurred in certain hosts infected with races 11 and 56 of *P. graminis* under similar conditions.

Sando (W. J.). **Reaction to stem and leaf rust and a soil borne virus of hybrid selections of Wheat × Agropyron × Wheat and Wheat × Wheat.**—*Plant Dis. Reptr*, 37, 5, pp. 296–299, 1953. [Multilithed.]

In the autumn of 1951, 79 selections (the parentage of each is given) from wheat × *Agropyron* × wheat [cf. *R.A.M.*, 32, p. 73 and next abstract] and wheat × wheat hybrids were tested at ten different stations in the United States and Mexico, and at St. Croix, Virgin Islands, for resistance to *Puccinia rubigo-vera* var. *tritici* [*P. triticina*: loc. cit.], *P. graminis* var. *tritici* [loc. cit.], and viruses. Eleven selections showed outstanding resistance to both rusts at most of the stations, and of these, Nos. 59, 98, and 99 were, in addition, resistant to an [unspecified] soil-borne virus in North Carolina.

Sando (W. J.) & Lowther (C. V.). **Reactions at Beltsville, Maryland, of segregates from hybrids of Wheat × Agropyron elongatum × Wheat to eight races of Puccinia graminis tritici.**—*Plant Dis. Reptr*, 37, 5, pp. 300–301, 1953. [Multilithed.]

Of the 11 selections from hybrids of wheat × *Agropyron elongatum* × wheat [see preceding abstract] tested in the greenhouse for reaction to eight races of *Puccinia graminis tritici* [*R.A.M.*, 32, p. 369] in 1952, all but one were highly resistant, No. 36 displaying the most outstanding resistance of any wheat tested so far. Most of the segregates were also highly resistant to local races of leaf rust (*Puccinia rubigo-vera* var. *tritici*) [*P. triticina*: loc. cit.] in the field and to powdery mildew (*Erysiphe graminis*) [ibid., 30, p. 605] in the greenhouse.

Hannah (A. E.). **Inheritance of reaction to bunt in crosses involving Redman Wheat and some of its ancestors.**—*Diss. Abstr.*, 13, 2, p. 156, 1953. [Litho-printed.]

Studies of the inheritance of reaction to one collection of physiologic race 1 of wheat bunt (*Tilletia foetida*) [cf. *R.A.M.*, 25, p. 209] were made at the University of Minnesota in crosses of resistant Redman, its resistant parents Regent and Canus [ibid., 29, p. 495], and the susceptible grandparent Reward. Redman appears to have derived one resistance gene (*a*) from Canus and two (B and C) from Regent. The crosses were made in all combinations except reciprocals. A percentage infection value, based on assumptions of gene values and gene action, was assigned to each genotype involved in the cross. A mean percentage infection value, based on the above values, was calculated for each genotypically different F_3 line. The same assigned values were used for all crosses where applicable.

Regent × Canus segregated susceptible lines, indicating that the genes conditioning bunt resistance are different. Redman × Canus and Redman × Regent did not segregate susceptible lines, indicating that Redman received resistance genes from both parents. The Canus genes, however, gave more complete resistance to race 1 of *T. foetida* than did the Regent genes.

The results of resistant × susceptible crosses indicated that Canus carried an incompletely recessive major gene and a minor dominant gene which conditioned resistance to race 1. The effect of the minor gene was masked in the presence of the homozygous major recessive gene. Regent differed from the susceptible parent by multiple genes, possibly three pairs. None of the latter reduced the infection percentage appreciably, but a combination of all three reduced it to 3·8. A combination of the Canus and Regent genes carried by Redman reduced the infection percentage to 0·5.

Tests of [the reaction of] selected F_4 lines to two additional races of bunt indicated that either the Canus or Regent genes gave effective resistance to race 2 of *T. caries* [cf. ibid., 32, p. 240] but conferred only partial resistance to a virulent race designated T.F. 48–7 of *T. foetida*. Certain lines combining the Regent and Canus genes appeared to confer effective resistance; the Redman genotype should have effective resistance to all three races.

Bohus (G.) & Podhradszky (J.). **A búza kőüszögjét okozó Tilletia-fajok hő- és talajnedvesség igényére vonatkozó vizsgálatok.** [Investigations with regard to temperature and soil humidity claims of *Tilletia* species causing bunt.]—*Ann. hist.-nat. Mus. hung.*, N.S., 3 (*1952*), pp. 37–46, 12 graphs, 1 map, 1953.

In studies on *Tilletia* species in Hungary [cf. *R.A.M.*, 29, p. 92] no essential difference could be detected in the temperature relations of *T. foetida* [loc. cit.] and *T. triticoides* [ibid., 31, p. 323], 10° to 18° C. being the optimum for wheat growth and most favourable for bunt development in Hungary. The optimum soil humidity (in brown clay soil containing some Kiscell humus) for spore germination of *T. foetida* was 59 per cent. and for *T. triticoides* 71·2 to 84 per cent. There is a definite connexion between the distribution of these fungi and the quantity of rainfall in Hungary. The incidence of *T. foetida* is over 95 per cent. in regions with an annual rainfall below 600 mm., while that of *T. triticoides* is negligible. The latter, however, causes severe and large-scale damage in regions where rainfall exceeds 650 mm.

Koehler (B.), Bever (W. M.), & Bonnett (O. T.). **Soil-borne Wheat mosaic.** *Bull. Ill. agric. Exp. Sta.* 556, pp. 567–599, 11 figs., 4 graphs, 1 map, 1952.

This is a review of the history, symptoms, host range, factors affecting, and work done so far in Illinois on the soil-borne wheat mosaic virus [*R.A.M.*, 32, p. 551 and next abstract] and its control, most of which has been noticed in this *Review*. The

development of resistant varieties appears to be the only solution. Among such varieties recommended for southern and central Illinois are Royal and Saline, as well as Seneca and Newcaster for the former area and Westar (with medium resistance) for the latter.

Fellows (H.), Sill (W. H.), & King (C. L.). **The 1952 epiphytotic of a soil-borne Wheat mosaic in Kansas.**—*Plant Dis. Reptr*, 37, 5, pp. 287–289, 1 diag., 1953. [Multilithed.]

In 1952 an epiphytotic of a soil-borne wheat mosaic virus [see preceding abstract], accompanied by severe yellowing early in the season, mosaic mottling, and stunting, but no rosette symptoms, was reported in the eastern counties of Kansas. On the whole, losses from the disease were relatively light and one season's observations suggest that many of the varieties commonly grown in Kansas are at least moderately resistant. Pawnee showed severe mosaic mottlings in the early spring but recovered rapidly later in the growing season.

Slykhuis (J. T.). **Wheat streak mosaic in Alberta and factors related to its spread.**—*Canad. J. agric. Sci.* (formerly *Sci. Agric.*), 33, 2, pp. 195–197, 1953.

Wheat streak mosaic [wheat mosaic virus: see preceding abstracts] was observed on a small percentage of wheat plants in most fields in southern Alberta. In several fields of winter and spring wheat high percentages of plants were infected, resulting in serious crop damage which was particularly severe in early seeded winter and late seeded spring wheats growing near a source of infection. Preliminary experiments with a mite (*Aceria* sp.) on diseased wheat indicate a close association between its feeding and disease transmission.

Eslick (R. F.). **Yield reductions in Glacier Barley associated with a virus infection.**—*Plant Dis. Reptr*, 37, 5, pp. 290–291, 1953. [Multilithed.]

In studies at the Montana Agricultural Experiment Station seed-borne virus infection of Glacier barley, possibly false stripe [*R.A.M.*, 30, p. 408 and next abstract], caused an average yield loss of 31 per cent. over the five-year period from 1947 to 1951. The disease constitutes a serious threat to barley cultivation in Montana.

McKinney (H. H.). **New evidence on virus diseases in Barley.**—*Plant Dis. Reptr*, 37, 5, pp. 292–295, 1953. [Multilithed.]

In greenhouse experiments at Beltsville, Maryland, comparisons were made between Glacier barley plants grown from six high-yielding and six low-yielding sources of seed and ten other varieties from seed artificially infected with barley false stripe virus [see preceding abstract]. Symptoms in Glacier were comparatively slow to develop and very weak, but assays indicated the presence of seed-borne viruses, probably mostly mild strains of false stripe, in about 90 per cent. of the plants from one low-yielding source of seed. Yield reductions in five of the other varieties were correlated with the severity of the disease. It is suggested that virus infection might be responsible for the 'running out' of certain varieties. The spray inoculation method [*R.A.M.*, 31, p. 12] was found to be satisfactory for barley false stripe.

Brome mosaic virus [ibid., 24, p. 151] or a strain of it was isolated from leaves of the barley hybrid Feebar × Trebi collected at Lincoln, Nebraska.

Peturson (B.). **Studies of specialization and pathogenicity in Puccinia coronata Corda I.**—*Diss. Abstr.*, 13, 2, pp. 159–160, 1953. [Lithoprinted.]

Investigations at the Dominion Laboratory of Plant Pathology, Winnipeg, Manitoba, revealed that *Rhamnus cathartica* in Canada is attacked by three distinct

varieties of *Puccinia coronata* [*R.A.M.*, 26, p. 8; cf. 32, p. 543], viz., *avenae*, *festucae*, and a new variety [without a Latin diagnosis] *secalis*, which is pathogenic to many species of cultivated rye and *Agropyron*, *Bromus*, *Elymus*, and *Hordeum* spp., but not to oats. It differs from the other two varieties in having longer apical processes to the teleutospores and noticeably darker uredospores. The varieties *avenae*, *secalis*, and *festucae* comprised 60·6, 36·6, and 2·8 per cent., respectively, of 71 isolates of *P. coronata* from *R. cathartica* in eastern Canada. In Manitoba var. *secalis* was more prevalent than var. *avenae*; var. *festucae* did not occur.

As a result of annual surveys throughout Canada from 1935 to 1950, 26 races and biotypes of *P. coronata* were identified from 2,186 isolates studied, using the 13 standard differential oat hosts employed in Canada and the United States for race identification, plus the varieties Mutica Ukraine C.I. 3259 and Saia C.I. 4659. Races 1 to 6, inclusive, predominated from 1935 to 1948. In 1946 the races attacking Bond (34, 45, 57) began to increase significantly and predominated in 1950. All the common races were widespread throughout the country though 2 and 3 predominated in eastern Canada. No race or biotype was pathogenic to the varieties Landhafer, Santa Fe, Trispernia, and Victoria now used for breeding for crown rust resistance [ibid., 32, p. 371]. All race identifications were made at controlled temperatures (65° to 70° F.). The rust lowered the yield, quality, test weight, grade, and protein content of oat grain, the amount of damage incurred being roughly proportional to the severity of infection. An infection range of 68 to 80 per cent. reduced yields by 19·2 to 27·8 per cent., kernel weight by 12·3 to 16·1 per cent., bushel weight by 2·7 to 6·7 lb., and quality by about one grade. A 90 per cent. infection on Anthony oats caused corresponding reductions of 81·2 per cent., 32·7 per cent., 14 lb., and several grades. Moderate to heavy infections reduced the protein content by 0·74 to 1·24 per cent.

Naumov (N. A.). Новый гриб на озимой Ржи. [A new fungus on winter Rye.]—Бот. Матер. (*Not. syst. Sect. crypt. Inst. bot. Acad. Sci. U.S.S.R.*), 6, 1–6, pp. 79–80, 2 figs., 1949.

Sclerospora secalina n.sp. was found on living and dying leaves of rye between May and August, 1942, in the U.S.S.R. The numerous oogonia measured 33 to 38 [? 48] μ in diameter, the antheridia 14·7 by 18 μ, and the oospores 31 to 46 μ. The conidial stage was not seen.

Rothman (P.) & Frey (K. J.). **Effect of stem rust on yield, test weight, and maturity of Oats.**—*Plant Dis. Reptr*, 37, 5, pp. 302–305, 1953. [Multilithed.]

At Michigan Agricultural Experiment Station, East Lansing, the potential damage caused by oat stem rust (*Puccinia graminis avenae*) [*R.A.M.*, 32, p. 478] was determined by comparing grain yield, weight per given volume of grain (test weight), and relative maturity of resistant and susceptible oat strains from the same cross grown under epiphytotic conditions in 1951 and 1952. Reductions of 25 per cent. in yield and 8 per cent. in test weight, and a two-day delay in heading were recorded for susceptible strains of Wolverine × Hajira-Joanette.

Schafer (J. F.), Caldwell (R. M.), Compton (L. E.), & Patterson (F. L.). **Reaction of Oats varieties and selections to powdery mildew at Lafayette, Indiana.**—*Plant Dis. Reptr*, 37, 5, pp. 306–309, 1953. [Multilithed.]

Severe attacks of powdery mildew (*Erysiphe graminis*) were recorded on oats [*R.A.M.*, 32, p. 552] in the greenhouse at Lafayette, Indiana, from 1950 to 1952. In resistance trials in January, 1951, 130 varieties and selections displayed considerable variation in the degree of mildew development but none was free from the disease.

Mehta (P. R.), Singh (B.), Mathur (S. C.), & Singh (S. B.). **Varietal reaction of Jowar to grain smut.**—*Nature, Lond.*, 172, 4378, p. 591, 1953.

Sorghum smut (*Sphacelotheca sorghi*) generally causes 2 to 5 per cent. infection in the United Provinces, India [*R.A.M.*, 32, p. 472], 2 per cent. representing an annual loss of over 5,000 tons of grain. Up to 65 per cent. infection has been recorded in some fields.

In resistance tests at Kanpur seeds were moistened with water and mixed thoroughly with smut spores before sowing. Resistant varieties showing less than 1 per cent. infection were 31B and 4101 [ibid., 32, p. 176]. Those moderately resistant (less than 5 per cent. infection) were 4403, 4404A, S.A. 7005, 4801(*a*), and 4403B. Most of the susceptible varieties showed 30 to 65 per cent. infection.

Kerle (W. D.). **Maize hybrids and varieties—district recommendations for 1952 sowing.**—*Agric. Gaz. N.S.W.*, 63, 6, pp. 286–289, 1952.

Notes are given on the characteristics of the hybrid maize varieties recommended for growing in the various districts of New South Wales during 1952. Of the late-maturing hybrids Standfast (G.H. 96A), Ensign (G.H. 112A), Victory (G.H. 134), and Jubilee (G.H. 172) are highly resistant to leaf blight [*Helminthosporium turcicum*: *R.A.M.*, 32, p. 619]. The early-maturing hybrids Dawn (N.E.H. 6), Sterling (N.E.H. 16), Sunrise (N.E.H. 17), and D.S. 28 (U.S. 13) are resistant to [unspecified] cob rots [ibid., 26, p. 392] and Emblem (N.E.H. 7) to ear rots [loc. cit.].

Stanton (W. R.) & Cammack (R. H.). **Resistance to the Maize rust, Puccinia polysora Underw.**—*Nature, Lond.*, 172, 4376, pp. 505–506, 1953.

In a search for sources of resistance to the maize rust in West Africa caused by *Puccinia polysora* [*R.A.M.*, 32, p. 620] a wide range of material was tested in the field at the West African Maize Rust Research Unit, Ibadan, Nigeria, and under controlled conditions by methods similar to those of Manners [ibid., 29, p. 609]. Resistance was dominant to susceptibility. The varieties were rated on a scale of 0 to 4. No variety or line was rated 0 (host immune; no uredosori present and no hyphae in the host tissues, but hypersensitive flecks may be present); rating 1 (host very resistant; characterized by abortive and isolated uredosori surrounded by sharply defined necrotic areas) was given to several varieties from Mexico, Venezuela, and the Caribbean. Other varieties from these areas were highly tolerant. United States material was of variable resistance. All African and Asian stocks tested were susceptible. Five Mexican varieties appeared to be suitable for breeding for resistance under West African conditions.

Boewe (G. H.). **Stewart's disease prospects for 1953.**—*Plant Dis. Reptr*, 37, 5, pp. 311–312, 1 map, 1953. [Multilithed.]

The annual forecast of the probable incidence of Stewart's disease of maize (*Bacterium* [*Xanthomonas*] *stewartii*) [*R.A.M.*, 31, p. 61] in Illinois [ibid., 29, p. 556] in 1953 is given. Regional forecasts are based on the temperature index (sum of the mean temperatures for December, January, and February of the preceding winter). If the index is 100 or more early season wilt will probably be destructive, 90 to 100 indicates light to severe infection, and below 90 absent or nearly so; above 90 late season leaf blight will be severe, 85 to 90 moderate to severe, 80 to 85 light to moderate, and below 80 a trace.

Ford (H. W.). **Effect of spreading decline disease on the distribution of feeder roots of Orange and Grapefruit trees on Rough Lemon rootstock.**—*Proc. Amer. Soc. hort. Sci.*, 61, pp. 68–72, 1953.

Spreading decline disease of citrus is indigenous to the sandy soils of central

Florida [*R.A.M.*, 31, p. 542 and next abstract]. Mature trees affected with this disease were found to have about 40 per cent. fewer feeder roots than healthy trees. Trees planted in spreading decline soil did not develop a normal root system, there being practically none below 30 to 42 in., but more than usual in the topmost 10 in.

Ford (H. W.). **Changes in rate of respiration and catalase activity associated with spreading decline of Citrus trees.**—*Proc. Amer. Soc. hort. Sci.*, 61, pp. 73-76, 1953.

The symptoms of citrus spreading decline in Florida [see preceding abstract] are sparse foliage, dead wood, and reduced growth, but no causal organism has yet been isolated. At the Citrus Experiment Station, Lake Alfred, it was found that there was a progressive increase in respiration rate (as determined from root tips and leaf disks) from the decline area up to and including the third healthy tree beyond the margin of an infected area. Catalase activity, as determined by oxygen liberated from hydrogen peroxide in Heinicke tubes, was highest in the third or fourth healthy tree beyond the decline margin.

Grant (T. J.) & Schneider (H.). **Initial evidence of the presence of tristeza, or quick decline, of Citrus in Florida.**—*Phytopathology*, 43, 1, pp. 51–52, 1953.

Tests for the presence of quick decline or tristeza of citrus [*R.A.M.*, 32, pp. 251, 621] in Florida [ibid., 32, p. 429] were initiated in September, 1951, with the inoculation of the Key, Beledy, and Kirk varieties of West Indian lime [ibid., 30, p. 566] with material from sweet orange trees on sour orange rootstocks suffering from unidentified decline by the bottle approach graft method. Examination of bark samples from 26 suspected trees showed 11 to be positive for quick decline with phloem reactions typical of the disease, eight doubtful, and seven negative. Graft inoculation with twigs from 13 declining field trees resulted in the development of definite vein-clearing on the leaves of 26 lime plants, while faint symptoms of the same type were induced in eight grafted with material from four other trees. Five of the earliest inoculated lime plants to show definite vein-clearing bore stem pits under the bark. So far the vein-clearing symptom has been transmitted from three infected West Indian lime test plants to six healthy plants.

Most of the inoculated plants that developed vein-clearing tended to produce symptom-free new growth in contrast to similar lime plants artificially infected in Brazil with the severe form of tristeza virus, suggesting the presence in Florida of a mild or intermediate strain [ibid., 30, p. 413]. In the field quick decline or tristeza symptoms, resembling those described from other parts of the world, have been observed on the Temple, Valencia, Lue Gim Gong, and Parson Brown sweet orange varieties on sour orange rootstocks.

Brinkerhoff (L. A.). **Cottonseed treatment for Oklahoma.**—*Mimeo. Circ. Okla. agric. Exp. Sta.* M–216, 3 pp., 1951. [Mimeographed. Received 1953.]

During seven years (1944 to 1950), chemical seed treatments consistently increased cotton stands in tests conducted in Oklahoma. An average increase of 10·8 per cent. is shown for ceresan M and of 8·4 for dow 9B. Recommended rates of treatment for all types of cotton seed with ceresan, ceresan M, dow 9B, spergon, and arasan [*R.A.M.*, 31, p. 422] are given, suitable for conditions in Oklahoma.

Steinhaus (E. A.). **Diseases of insects reared in the laboratory or insectary.**—26 pp., California Agricultural Experiment Station Extension Service, 1953.

In the section of this book dealing with infectious diseases of insects (pp. 5–8) [*R.A.M.*, 29, p. 100] brief, general notes are given on those caused by viruses,

bacteria, and fungi. The general symptoms of the three types of disease and the usual manner of infection are indicated. A further section (pp. 9–25) is devoted to general control methods.

Van der Laan (P. A.). **Een schimmel als parasiet van de cyste-inhoud van het Aardappelcystenaaltje (Heterodera rostochiensis Wollenw.).** [A fungus as parasite of the cyst contents of the Potato cyst eelworm (*Heterodera rostochiensis* Wollenw.).]—*Tijdschr. PlZiekt.*, 59, 3, pp. 101–103, 1953. [English summary.]

A probably undescribed fungus akin to *Phoma* or *Pyrenochaeta* has frequently been found parasitizing the cysts of the potato root eelworm, *Heterodera rostochiensis* [cf. *R.A.M.*, 14, p. 33]. The black spots, 20 to 300 μ in diameter, situated mainly on the inner side of the cyst wall, consist of pycnidia furnished with long hyphal appendages and containing spores 3·8 by 2·1 μ.

In hatching tests substantially fewer larvae emerged from spotted than from unspotted cysts. Cysts in tubers of cherry agar readily became infected by the fungus, which could be discerned within them, entwining and shrivelling the eggs, and was reisolated from them.

Fischer (C.). **Long-term holding of cut flowers.**—*Proc. Amer. Soc. hort. Sci.*, 61, pp. 585–592, 3 graphs, 1953.

Experiments were carried out at Cornell University, Ithaca, New York, to determine the optimum storing conditions for various cut flowers. Carnations, chrysanthemums, roses, lilies-of-the-valley, and garden lilies were best stored at 31° F. Flowers stored in a moisture-proof package kept better than those at the same temperature with the cut ends in water or in floralife (a patented preservative containing sugar, aluminium sulphate, and hexamethylenetetramine). Injury due to [unspecified] moulds on flowers in packages was much less at 31° to 35° than at 35° to 45° F.

Asen (S.) & Tukey (H. B.). **Leaf scorch on the Snow White variety of greenhouse Rose as influenced by various concentrations of boron and calcium.**—*Proc. Amer. Soc. hort. Sci.*, 61, pp. 515–521, 4 figs., 1953.

In experiments at Michigan State College, East Lansing, leaf scorch on the Snow White variety of rose was effectively controlled when high calcium (300 p.p.m.) and medium high boron (0·25 p.p.m.) [*R.A.M.*, 32, p. 379] concentrations were available to the plants. The data support the hypothesis that boron aids in more efficient utilization of calcium in plant metabolism, especially in cell wall processes.

Hellmers (E.). **Bacterial leaf spot of Pelargonium (Xanthomonas pelargonii (Brown) Starr & Burkholder) in Denmark.** —*Trans. Danish Acad. tech. Sci.* 4 (*Contr. Dep. Plant Pathol. Copenhagen* 38), 40 pp., 11 figs., 1953.

In August, 1951, pelargoniums in a Copenhagen nursery were severely attacked by a bacterial disease caused by *Xanthomonas pelargonii*. *Pelargonium domesticum*, *P. hortorum*, and *P. peltatum* were susceptible to the disease, while *P. graveolens* was immune. The bacterium causes leaf spotting and a dry, brown stem rot. *Pythium* stem rot (caused by *P. debaryanum*) [cf. *R.A.M.*, 31, p. 386] is a greenish black soft rot. The principal sources of infection are cuttings taken from diseased plants. Control is effected by spraying with 0·1 per cent. mercusan or 1 per cent. Bordeaux mixture, by keeping plants as dry as possible, and by cutting off and destroying all diseased tissue.

Thomas (W. D.). **Malformation of Carnation blossoms caused by Aster yellows virus.**—*Plant Dis. Reptr*, 37, 5, p. 284, 1 fig., 1953. [Multilithed.]

A flower malformation of Hercules carnations recently observed in commercial greenhouses in the Denver and Colorado Springs areas, Colorado, was shown by grafting to be a varietal expression of aster yellows virus, occurring only at high temperatures (above 80° F. in the daytime). The calyx, pinched and tight with the normal tipped peak missing in unopened buds, is only half its usual size on opening, the segment tips being indistinct and the whole flower stunted. Affected plants usually develop streak symptoms [*R.A.M.*, 28, p. 334] typical of the virus.

Brierley (P.) & Smith (F. F.). **Noordam's B virus of Chrysanthemum detected in the United States.**—*Plant Dis. Reptr*, 37, 5, pp. 280–283, 1953. [Multilithed.]

In studies at Beltsville, Maryland, Noordam's chrysanthemum b virus [*R.A.M.*, 32, p. 559] was transmitted by sap inoculation to *Petunia* from 17 chrysanthemum stocks. It appears to be quite common in the United States. It was also detected in Nightingale, Delia, and Mayford Pink from England, and a Danish variety maintained as sources of tomato aspermy virus [ibid., 31, p. 284], the diffuse, yellowish mottle produced in Good News by grafting with these varieties being due to virus b and not to tomato aspermy. Virus b was also transmitted to Good News by *Macrosiphoniella sanborni*, *Myzus persicae*, *M.* [*Aulacorthum*] *solani*, and *Rhopalosiphum rufomaculatum*.

Since the type stocks of chrysanthemum Q virus [ibid., 31, p. 120] in Blanche and Good News caused virus b reaction in *Petunia*, the latter virus may be a mild strain of the former, or Q may be a complex with virus b as one of the constituents.

Martin (C.). **Améliorations apportées à l'extraction du virus de la mosaïque du Dahlia (Marmor dahliae) Holmes.** [Improvements effected in the extraction of *Dahlia* mosaic virus (*Marmor dahliae*) Holmes.]—*Ann. Inst. nat. Rech. agron.*, Sér. C (*Ann. Épiphyt.*), 3, 3, pp. 395–396, 1952.

The author, in work at the Central Station of Plant Pathology, Versailles, effected an improvement in the method of extracting *Dahlia* mosaic virus [*R.A.M.*, 32, p. 470] by inhibiting the tannin-protein reaction. The host tissues were ground in a solution containing 2·5 to 3 per cent. sodium bisulphide and 0·1 to 0·3 per cent. potassium cyanide. Pigments were removed by repeated precipitation with saturated ammonium sulphate.

Fink (H. C.). **Topple, a new disease of Gladiolus in western North Carolina.**—*Plant Dis. Reptr*, 37, 5, pp. 285–286, 1 fig., 1953. [Multilithed.]

A disorder of harvested *Gladiolus* flowers characterized by breaking of the flower stalk anywhere on the spike but usually a quarter inch above a point of flower attachment, with consequent 'topple' of the flowers, occurred on the New Europe, Corona, Snow Princess, and Picardy varieties in western North Carolina in 1952. The area near the break becomes water-soaked two to three days later and a strong sour odour emanates. The disease was not observed in the field, but may be associated with calcium deficiency. When a foliage spray of 2 per cent. calcium nitrate was applied at the rate of 54 gals. per acre two weeks before flowering on New Europe and Corona, only 18·7 per cent. of the flower spikes toppled, compared with 67 per cent. of the untreated.

Maramorosch (K.). **A versatile virus.**—*Sci. Amer.*, 188, 6, pp. 78–86, 1953.

This is a semi-popular, historical account of the relation between the aster

yellows virus, the host plant [*Callistephus chinensis*], and the vector leafhopper (*Macrosteles fascifrons*) [*M. divisus*: *R.A.M.*, 31, p. 475].

Research work and workers.—*Seed World*, 73, 3, p. 32, 1953.

Du Puits, a new French variety of lucerne, is reported to be resistant to leaf spot [*Pseudopeziza medicaginis*: *R.A.M.*, 29, p. 311] but susceptible to bacterial blight [*Corynebacterium insidiosum*: ibid., 32, pp. 319, 564].

Sprague (R.) & Fischer (G. W.). **Check list of the diseases of grasses and cereals in the western United States and Alaska.**—*Sta. Circ. Wash. agric. Exp. Sta.* 194, 188 pp., 1952. [Mimeoprinted. Received 1953.]

This alphabetical host-fungus and fungus-host index (including bacteria) represents an attempt to compile all available, reliable reports of diseases of grasses and cereals [*R.A.M.*, 30, pp. 80, 324, 420, 432, 472] in Alaska and 16 western States of U.S.A.

Harder (A.). **Sind die Bienen an der Übertragung und Verbreitung der Fruchtmonilia beteiligt?** [Are bees implicated in the transmission and spread of the fruit *Monilia*?]—*Schweiz. Z. Obst- u. Weinb.*, 61, 26, pp. 541–543, 2 figs., 1952.

Evidence was secured at the Wädenswil Experiment Station, Zürich, that bees carry the spores of *Sclerotinia fructigena* from diseased to healthy fruits, though the extent of dissemination is not known. It was shown by experiments on pears and plums that previous wounding is necessary for infection to be transmitted by bees. Quince blossoms also may be contaminated in this way by spores.

Shutak (V. G.), Christopher (E. P.), & Pratt (L. C.). **Role of cutin in storage scald.**—*Proc. Amer. Soc. hort. Sci.*, 61, pp. 228–232, 1953.

The evidence presented in this paper from Rhode Island Agricultural Experiment Station, Kingston, supports previous results indicating that storage scald of apples [*R.A.M.*, 29, p. 314 and next abstract] (the Cortland variety in these experiments) is caused by the accumulation of a toxic substance or substances under the skin. The waxy coating serves as a barrier controlling the accumulation of scald-producing substances. The amount of scald is not predetermined early in storage and may be affected by treatments later or even after storage.

Shutak (V. G.) & Christopher (E. P.). **Effect of mineral oil on storage scald of Apples.**—*Proc. Amer. Soc. hort. Sci.*, 61, pp. 233–236, 1953.

In 1949, 1950, and 1951 storage scald of Cortland apples [see preceding abstract] was controlled at Rhode Island Agricultural Experiment Station, Kingston, by dipping the fruits in a mineral oil emulsion (up to 3 per cent.) before storing. Rhode Island Greenings may suffer injury from this treatment, while other varieties should be thoroughly tested before the method comes into general use. The emulsion is made by adding 0·1 or 0·2 per cent. dried blood to heavy mineral oil plus two drops of Dupont's spreader sticker to each 5,000 ml. emulsion.

Margolin (A. F.). Метод борьбы с хлорозом листьев. [A method of controlling leaf chlorosis.]—Сад и Огород [*Orchard & Garden*], *1953*, 3, p. 76, 1953.

Leaf chlorosis was observed on apple [cf. *R.A.M.*, 19, p. 714] and pear [loc. cit.; ibid., 24, p. 112] seedlings in a nursery in the Poltava region, U.S.S.R., during the summer of 1952. Ten to 15 days after spraying the crowns of the plants with 2 per cent. ferrous sulphate, chlorosis disappeared and the leaves became green.

McKnight (T.). **Collar rot disease of Apples.**—*Qd agric. J.*, 77, 1, pp. 9–12, 2 figs., 1953.

During the past five years losses of up to 60 per cent. have been caused in apple orchards on granitic sands and sandy loams in the Stanthorpe area of Queensland by collar rot due to *Sclerotium rolfsii* [*R.A.M.*, 29, p. 203]. Infection is particularly severe on old land repeatedly cropped with vegetables. It appears most frequently in trees two to three years old, though those up to 14 years have been attacked.

Before young trees are planted the roots should be carefully examined; any infected trees should be burnt and the remainder dipped in Bordeaux or Cheshunt mixture or a suspension of a proprietary copper spray. Regular inspections should be made after the trees have been set out and at the first sign of attack the infected portion of the trunk should be cut away down to healthy tissue, the wound being treated with a thick paste of the fungicide. The soil should be kept away from the exposed part for up to ten weeks, the paste application being renewed if necessary. This method appears to give effective control if applied before any considerable area of the trunk has become affected.

Fogliani (G.). **Segnalazione della virosi a scopazzi del Melo.** [Report of witches' broom virosis of Apple.]—*Notiz. Malatt. Piante, 1952*, 21, pp. 10–11, 1 pl., 1952. [English summary, p. 71. Mimeographed.]

In 1948 one or two eight-year-old, ungrafted Abbondanza apple trees growing near Varese, Italy, were affected by witches' brooms. In 1950 grafts were made on Annurca trees with Golden Delicious and two of them developed brooming in 1952, while three Golden Delicious trees from which scions had been taken also became affected. The evidence suggests that the disease can be transmitted on the pruning tools. Further studies are in progress.

Virus diseases and other disorders with viruslike symptoms of stone fruit in North America.—*Agric. Handb. U.S. Dep. Agric.* 10, viii+275 pp., 27 col. pl., 79 figs., Washington, 1951. [Received 1953.] $2.50.

This useful, well-illustrated handbook describes the viroses of peach (pp. 1–97), sweet cherry, (pp. 98–148), flowering cherry (pp. 149–151), sour cherry (pp. 152–170), plum and prune (pp. 171–186), apricot (pp. 187–188), and almond (pp. 189–194), virus-like diseases not proved transmissible (pp. 195–214), and deficiency and excess troubles that resemble virus diseases (pp. 215–251), with a key to nutrient deficiencies in peach trees. Each disease is described by an expert or group of experts, the common names of the disease and of the virus, geographical distribution, history and economic importance, host range, symptoms, transmission, and control measures being given. There are 322 bibliographical references and a host-disease index.

Adam (D. B.), Grace (J.), & Flentje (N. T.). **The 'gummosis' or 'die-back' disease of Apricots.**—*Tasm. J. Agric.*, 23, 2, pp. 128–135, 7 figs., 1952.

The information in this paper on the disease of apricot trees in South Australia and Tasmania usually associated with *Cytosporina* sp. has already been noticed from another source [*R.A.M.*, 31, p. 497].

Smith (L. C.). **Shot hole disease causing heavy losses in Apricot and Peach orchards.**—*J. Dep. Agric. S. Aust.*, 56, 10, pp. 458–459, 3 figs., 1953.

Most of this information on apricot and peach shot hole disease (*Coryneum beijerinckii*) [*Clasterosporium carpophilum*] in New South Wales has already been noticed from another source [*R.A.M.*, 28, p. 462]. Yields in the Cadell district may be reduced by as much as 40 per cent. and in the upper river areas by 15 to 20

per cent., while in some years these figures may be increased to 50 per cent. if spraying is not practised [see above, p. 669]. In irrigated areas where zinc deficiency [ibid., 29, p. 569] also occurs a zinc sulphate dormant spray should be added to the usual shot hole schedule.

Savage (E. F.), Weinberger (J. H.), Luttrell (E. S.), & Rhoads (A. S.). **Clitocybe root rot—a disease of economic importance in Georgia Peach orchards.**—*Plant Dis. Reptr*, 37, 5, pp. 269–270, 1953. [Multilithed.]

Clitocybe tabescens is reported to be common in peach orchards [*R.A.M.*, 21, p. 497] throughout the peach-growing areas in Georgia and in the Piedmont and Sandhill peach sections of South Carolina. In Georgia the disease usually occurs in old orchards planted with peaches continuously for 30 to 50 years, the trees dying progressively at an earlier age with the gradual build-up of inoculum. One orchard on newly cleared forest land was also infected. Such sites should not be used for peach cultivation. Young orchards on land formerly under cotton did not appear to be infected.

Cadman (C. H.). **Studies in Rubus virus diseases. IV. Yellows diseases of Raspberries. V. Experiments in the analysis of Lloyd George decline.**—*Ann. appl. Biol.*, 39, 4, pp. 495–500, 501–508, 2 pl., 1952.

Continuing his studies at University College, Dundee, on *Rubus* virus diseases [*R.A.M.*, 31, p. 615; 32, p. 387], the author describes two diseases of Norfolk Giant raspberries provisionally named mild and severe yellows [ibid., 31, p. 192]. Both types are most conspicuous in early spring on the leaves of fruiting laterals and lower parts of young canes, severe yellows appearing as a vivid yellowing or bronzing of the interveinal areas, which in extreme cases may become completely bleached and necrotic. On subsequent leaves the chlorosis is generally less severe and often forms a watermark or oak-leaf pattern. Similar yellowing developed on St. Walfried (with apical necrosis and rosetting), Lloyd George, and Malling Notable following grafting. In mild yellows the interveinal areas are pale yellow and may develop necrotic patches. On later leaves the chlorosis is confined to narrow bands bordering the smaller leaf veins, while in midsummer there is only a diffuse chlorotic watermarking. The virus was transmitted by grafting to Norfolk Giant, St. Walfried, Lloyd George, and Malling Notable. The symptoms of both diseases vary greatly in intensity from one season to another. Their etiological relationship is obscure, but there was some evidence that they may be caused by related strains of a single virus.

No plant of the Devon variety was free from yellows symptoms or from mosaic 2. Mild yellows symptoms are very common on degenerate stocks of Lloyd George in the field in Scotland.

In the second paper studies on 'symptomless decline' of Lloyd George infected with a complex of viruses that produces mosaic 2 [ibid., 19, p. 293; 31, p. 192] on Baumforth's Seedling B and Norfolk Giant showed that the viruses concerned are yellows, another termed 'leaf spot', transmitted by *Amphorophora rubi*, and a third on which work is still progressing. The leaves of plants inoculated with virus leaf spot by means of *A. rubi* are covered with translucent, angular, chlorotic spots which often coalesce, causing curling, twisting, and often asymmetric development of the lamina. Cane growth may be 'throttled' or stunted, with outgrowth of axillary branches. These symptoms are not masked in hot weather. The virus produces characteristic symptoms on Baumforth's Seedling B, Burnetholm Seedling, and Norfolk Giant, and is carried without symptoms by St. Walfried, Lloyd George, and many other European and North American varieties. Both mild yellows and leaf spot appear to be only subsidiary causes of raspberry degeneration.

The diseases described may all be considered to belong to severe mosaic 2 as originally defined [loc. cit.], and there is little doubt that they differ etiologically, though leaf spot virus is common to all. A disease conforming with the definition of mild mosaic 2 [ibid., 19, p. 293] was widely present in commercial stocks of Norfolk Giant and also in wild raspberries in Scotland. It was graft-transmissible to Norfolk Giant and Baumforth's B.

Thung (T. H.). **Waarnemingen omtrent de dwergziekte bij Framboos en wilde Braam II.** [Observations on the stunt disease of Raspberry and wild Blackberry II.] *Tijdschr. PlZiekt.*, 58, 6, pp. 255–259, 1952. [English summary.]

A tabulated account is given of experiments carried out in 1952 at the Phytopathological Institute, Wageningen, Holland, which demonstrated the curative effect of heat treatments on the *Rubus* stunt virus disease of raspberry [*R.A.M.*, 32, p. 387]. Infected root suckers exposed to a temperature of 46° C. in an incubator for periods of $1\frac{3}{4}$ to $2\frac{3}{4}$ hours in January were mostly healthy in appearance at the final inspection on 3rd October, as also were those immersed in water at 45° for one to three hours. Comparable results were obtained in a smaller series of tests by five minutes' to one hour's immersion in water at 50°.

Frazier (N. W.) & Thomas (H. E.). **Strawberry a host of western Aster yellows virus.**—*Plant Dis. Reptr*, 37, 5, pp. 272–275, 2 figs., 1953. [Multilithed.]

In 1952 a strawberry disease of minor importance characterized by phyllody of the flowers [*R.A.M.*, 31, p. 337] was observed in commercial plantings of the Lassen variety in central California. From affected plants *Macrosteles divisus* transmitted western aster yellows virus [ibid., 25, p. 214; cf. 32, p. 433] to China aster and *Plantago major*. The virus was further experimentally transmitted to three of 22 wild strawberry plants.

Skiles (R. L.). **The Strawberry viruses in Minnesota.** *Diss. Abstr.*, 13, 2, p. 149, 1953. [Lithoprinted.]

In studies at the University of Minnesota apparently healthy strawberry plants representing 23 commercial varieties and four clones of Minnesota seedlings were collected in 19 counties of the State and each inarch-grafted to a healthy East Malling *Fragaria vesca* to determine the percentage of virus-infected plants [*R.A.M.*, 32, p. 573]. All but two varieties were 100 per cent. infected. Brilliant was the only one that indexed virus-free. The six different types of symptom observed were epinasty, chlorosis, dwarfing, and chlorotic, necrotic, and ring spotting. The viruses, either alone or in combination, produced ten different symptom pictures (or Minnesota virus classes), some of which were analogous to the British viruses 1, 2, and 3, but 4 [loc. cit.] was not present. The two most prevalent, all varieties considered, were characterized by a combination of epinasty and chlorosis and the same plus dwarfing. The symptoms of one virus (dwarfing and chlorosis) have not been described before.

Several indicator plants developed different symptoms in parent and runner plants when grafted to various commercial varieties. The parent leaves became epinastic and chlorotic while the runner leaves developed chlorotic spotting, indicating that the causal viruses moved in opposite directions in the indicators. *F. vesca* plants grafted to plants of Wisconsin 537 and Minnesota seedling 40–7 which expressed typical June yellows [see next abstract] all developed symptoms of Minnesota virus class 4 and Demaree and Marcus's type 2 [ibid., 31, p. 288].

The roots of *F. vesca* indicators inoculated first with the chlorosis virus [ibid., 32, p. 573] and then with *Rhizoctonia* sp. [cf. ibid., 31, p. 562] were rotted considerably more than those inoculated with the latter alone, indicating that the virus predisposed the plants to root-rot infection.

Bovey (R.). **La panachure printanière du Fraisier.** [Spring variegation of Strawberry.]—*Rev. romande Agric.*, 8, pp. 55–56, 2 figs., 1952.

Madame Moutot, Auchincruive Climax, Blakemore, and other strawberry varieties in Switzerland sometimes develop towards the end of April angular, chlorotic leaf spots. Fruiting is scarce and tardy, and severely attacked plants die prematurely. The author attributes the condition to genetic instability (June yellows) [*R.A.M.*, 32, p. 634 and preceding abstract].

Zentmyer (G. A.) & Muller (A. S.). **Phytophthora-induced diseases of Avocado in Central America.**—*Plant Dis. Reptr*, 37, 5, p. 271, 1953. [Multilithed.]

A description is given of avocado seedling blight (*Phytophthora* ? *palmivora*) [*R.A.M.*, 28, p. 343] which caused serious losses at the Escuela Agricola Panamericana, Tegucigalpa, Honduras, in 1951 and 1952. *P. cinnamomi* [ibid., 31, p. 338] caused root rot in 1952 in the same locality and at the Lancetilla Experiment Station, and was also recovered from trees near Orotina, Costa Rica [ibid., 31, p. 289], near Tenancingo, Mexico [loc. cit.], and from apparently healthy trees in Veracruz. Other diseases observed were scab (*Sphaceloma perseae*) [ibid., 31, p. 132] on fruit and branches in Honduras and Costa Rica, and powdery mildew (*Oidium* sp.) [ibid., 28, p. 8] in Honduras.

Batista (A. C.). **Necrose basal das folhas da Mangueira. E descrição de Ascochyta mangiferae n. sp. e Didymella mangiferae n. sp.** [Basal necrosis of Mango leaves. And a description of *Ascochyta mangiferae* n.sp. and *Didymella mangiferae* n.sp.]—*Bol. Sec. Agric. Pernambuco*, 19, 3–4, pp. 165–171, 7 figs., 1952. [English summary.]

Mango trees growing under very humid conditions near Cabo, Pernambuco, Brazil, were observed in November, 1951, to be suffering from an apparently new disease characterized by the development of numerous minute spots on the basal third of the leaves, followed by blight and desiccation. On older leaves the spots tend to merge into a large discoloured area, especially during the summer, and finally defoliation ensues. Two fungi, described as new, were isolated from the lesions, namely, *Ascochyta mangiferae* and *Didymella mangiferae*, of which the former is probably a state of the latter, though definite evidence of the connexion was not obtained.

The amphigenous, erumpent, globose, membranous to carbonaceous pycnidia of *A. mangiferae* measure 100 to 180 μ in diameter, the ostiole 8 to 12 μ in diameter, and the conidia 8 to 12 by 3·5 to 5 μ.

D. mangiferae is characterized by sparse, epiphyllous, globose to depressed, erumpent, fuscous, thick-walled perithecia, 125 to 180 μ in diameter, cylindrical, sessile or very short-stalked asci, 30 to 70 by 7 to 12 μ, and subfusoid, mono- or distichous, bicellular, hyaline, biguttulate spores, 10 to 14 by 3·5 to 6·5 μ.

Akamine (E. K.) & Arisumi (T.). **Control of postharvest storage decay of fruits of Papaya (Carica papaya L.) with special reference to the effect of hot water.**—*Proc. Amer. Soc. hort. Sci.*, 61, pp. 270–274, 1953.

The incidence of post-harvest storage decay of papaws (caused by the anthracnose fungi *Colletotrichum* sp. or *Gloeosporium* sp.) [*R.A.M.*, 21, p. 87; 31, p. 55], which had been fumigated with ethylene dibromide to destroy insects, was materially reduced at Hawaii Agricultural Experiment Station, Honolulu, by treating the fruits with hot water at temperatures of 110° to 120° F. for 20 minutes. After being held at 55° for 6 days and then brought to room temperature no rot developed for four days compared with 75 per cent. in untreated fruit. The marketability of the fruit was in no way affected by this treatment, which seems the solution to the

problem of storage decay of papaws shipped to the United States mainland from Hawaii.

Crop Protection Products Approval Scheme. Approved list 1952. 9th Edition.—13 pp., London, Ministry of Agriculture and Fisheries, 1952.

This list followed the usual lines [cf. *R.A.M.*, 23, p. 237] and includes, in addition, herbicides [see next abstract].

Martin (H.) & Miles (J. R. W.). **Guide to the chemicals used in crop protection.** 236 pp., Ontario, Science Service, Dominion of Canada Department of Agriculture, 1952. [Mimeographed.]

This useful publication, intended for the benefit of growers, biologists, and chemists, contains a fully annotated list of the chemicals used for the protection of crops against pests, diseases (including fungi), and weeds [cf. preceding and next abstracts]. Properties, characters, and analysis of each chemical are detailed. The chemicals are dealt with alphabetically under the name most commonly used in literature, alternative and technical names being given and indexed.

Frear (D. E. H.). **Pesticide handbook.**—204 pp., Pennsylvania State College, College Science Publishers, 1953. $1.25.

This handbook, the fifth edition [cf. *R.A.M.*, 32, p. 136], contains all the features of the previous editions and also a list of Pest Control Operators in all parts of the United States. Over 5,000 trade-named pesticides are listed [see preceding abstract].

Jacks (H.). **List of plant therapeutants under test in New Zealand. First supplement —September 1, 1952.** —Reprinted from *Orchard. N.Z.*, 24, 10, pp. 9–13, 1952.

This is a supplementary list of plant therapeutants under test at the Plant Diseases Division, Department of Scientific and Industrial Research, New Zealand, received from September, 1951, to September, 1952 [cf. *R.A.M.*, 32, p. 576].

Captan—a coined name for the fungicidal chemical N-trichloromethylthio tetrahydrophthalimide.—*Phytopathology*, 43, 1, p. 58, 1953.

The name 'captan' was approved on 25th September, 1952, by the United States Interdepartmental Committee on Pest Control for the fungicide N-trichloromethylthio tetrahydrophthalimide, formerly designated 'SR–406' and 'orthocide' [see above, p. 666].

Shepherd (E. F. S.). **Modern fungicides with special reference to their application in the tropics.**—*Export Rev. Brit. Drug & Chem. Industr.*, 14, 157, pp. 35–40, 6 figs., 1953.

After briefly discussing the chemical control of plant diseases, the author gives short notes in popular terms on the control of some of the most important diseases of the principal tropical crops by means of stem and foliage fungicidal applications and seed treatments.

Garton (J. E.). **A graphic solution of agricultural field sprayer problems.**—*Misc. Publ. Okla. agric. Exp. Sta.* 19, 4 pp., 1 fig., 1 graph, 1951. [Lithoprinted.]

In this paper, the first of a series of publications from the Oklahoma Agricultural Experiment Station on the graphic solution of sprayer operating problems [cf. *R.A.M.*, 32, p. 263 and next abstracts], a method is described for presenting field sprayer data. The graphs supplied enable the operator to determine at a glance

the machine speed, nozzle spacing, rate of application, or rate of discharge per nozzle for any particular operation.

GARTON (J. E.). **A graphic solution of airplane sprayer problems.**—*Misc. Publ. Okla. agric. Exp. Sta.* 20, 4 pp., 1 fig., 1 graph, 1951. [Lithoprinted.]

A new, improved graphic method of solving aeroplane sprayer problems is described [see preceding and next abstracts]. It enables the most suitable ground speed of the plane, width of swathe, total nozzle discharge, and rate of application to be determined.

GARTON (J. E.). **A graphic solution for mast type orchard sprayer problems.**—*Misc. Publ. Okla. agric. Exp. Sta.* 21, 4 pp., 2 figs., 1 diag., 1 graph, 1951. [Lithoprinted.]

In this publication information is given on a graphic method [see preceding abstracts] of solving mast type, automatic orchard sprayer problems. The method enables the determination of the most suitable rate and speed of sprayer travel, gallons of spray per tree, and number of nozzles and discharge of each, in relation to the spread of the tree. It should prove of practical value to commercial orchardists interested in accurate application of spray materials.

SAIVENOIS (A.). **Les causes de brûlures provoquées par les traitements antiparasitaires.** [The causes of burns induced by antiparasitic treatments.]—*Fruit belge, 1951*, 117, pp. 73–79, 1951. [Abs. in *Ann. Inst. nat. Rech. agron.*, Sér. C (*Ann. Épiphyt.*), 3, 3, pp. 411–412, 1952.]

Injury to plants by spray treatments may be avoided by proper care in the preparation and application of spray fluids, and by making due allowance for the age and condition of the host, the presence of insect bites, and the atmospheric conditions.

DIMOND (A. E.) & DAVIS (D.). **The chemotherapeutic activity of benzothiazole and related compounds for Fusarium wilt of Tomato.**—*Phytopathology*, 43, 1, pp. 43–44, 1953.

At the Connecticut Agricultural Experiment Station the potassium and sodium salts of 2-benzothiazoloxyglycolic acid were found to be very low in fungitoxicity, evaluated by the standard *Stemphylium* [*sarciniforme*] and *Sclerotinia* [*fructicola*] spore germination method [*R.A.M.*, 31, p. 563 *et passim*], but fairly high in chemotherapeutic potency against *Fusarium oxysporum* f. [*F. bulbigenum* var.] *lycopersici* [ibid., 32, p. 517]. The available evidence indicates that the compounds are not accumulated in the plant to a sufficient extent to explain their fungicidal efficiency.

Of the related compounds tested for chemotherapeutic potency, thiazole and mercaptobenzothiazole were inactive, benzothiazole and potassium α- (2-benzothiazolyl) thiopropionate moderately active, and sodium and potassium 2-benzothiazolylthioglycolates highly so. The chemotherapeutic efficacy of these compounds is directly correlated with their formative influence on tomato plants, suggesting an analogy between them and the phenoxy acids. Both chemotherapeutic and formative activity may be centred in the thiazole ring.

KONRAD (P.) & MAUBLANC (A.). **Les Agaricales. Tome II. Russulacées, Hygrophoracées, Gomphidiacées, Paxillacées, Bolétacées.** [The Agaricales. Volume II. Russulaceae, Hygrophoraceae, Gomphidiaceae, Paxillaceae, Boletaceae.]—(*Encycl. mycol.*, 20), 202 pp., Paris, Paul Lechevalier, 1952. 2,200 Fr.

This volume [cf. *R.A.M.*, 28, p. 359] contains the classification, revision of species, and guide to figures and comestibility of the fungi in the families concerned.

As they comprise fewer species than the Agaricaceae [loc. cit.] the characters, particularly of the little known, doubtful, or variously interpreted species, and references to illustrations have been considerably expanded. Black-and-white drawings and photographs have been deliberately omitted.

A final chapter is devoted to corrections and additions to Part I [loc. cit.], bringing it up to date.

PARKER-RHODES (A. F.). **The basidiomycetes of Skokholm Island X. Population densities.**—*New Phytol.*, 52, 3, pp. 273–291, 1 diag., 1953.

In this further contribution to the series [cf. *R.A.M.*, 32, p. 328] the author outlines the problem of estimating populations of irregularly fruiting fungi among the basidiomycetes of Skokholm Island from a series of records and the methods employed in its solution. As the logical validity of these estimations depends on the constancy of the populations, estimated statistical evidence on this point is given; the required constancy holds for the grassland fungi but not for those of the brakes. The total populations estimated are tabulated and briefly discussed and their distribution is given.

IWADE (I.), FUKUZUMI (T.), & YANAGAWA (R.). **Studies on antagonism of 'shiitake' Cortinellus edodes (Berk.) Sawada against wood-rotting fungi.**—*Bull. Tokyo Univ. Forests*, 43, pp. 111–126, 1952. [Abs. in *Rec. Res. Fac. Agric. Univ. Tokyo*, 2 (*1951–52*), p. 79, 1953.]

Antagonism was observed between *Cortinellus edodes* [*R.A.M.*, 32, p. 598] and other wood-rotting fungi, especially *Stereum umbrinum*, when grown in culture. The optimum pH for the antagonistic action was 3·6.

DRUMMOND-GONÇALVES (R.). **Liquido para a conservação de material destinado a museu.** [Liquid for the preservation of material intended for the museum.]—*Biológico*, 18, 11, pp. 188–191, 1 fig., 1952.

Full directions are given for the preservation of phytopathological material, comprising 6 to 24 hours' treatment with a fixative of 5 per cent. copper sulphate, two hours' washing, a fortnight's immersion in a solution of 5 to 6 per cent. sulphuric acid (15 ml. per l. distilled water), and mounting on a plaque, covered with a convex glass and sealed with a mixture of 300 gm. tar, 60 gm. virgin wax, and 1 gm. anhydrous lanolin.

WAKSMAN (S. A.). **Streptomycin. Isolation, properties and utilization.**—*J. Hist. Med.*, 3, pp. 318–347, 4 pl., 2 figs., 2 graphs, 1951. [Received July, 1953.]

After briefly reviewing the rapid progress made in the development of streptomycin [*R.A.M.*, 29, p. 270], the author describes the production of antibiotics by actinomycetes [ibid., 32, p. 582] and the history, production, and properties of streptomycin.

[This information is also given in a paper by the same author in *Antibiotics & Chemother.*, 3, 4, pp. 333–346, 1953.]

STESSEL (J. G.), LEBEN (C.), & KEITT (G. W.). **Partial purification and properties of the antifungal antibiotic, toximycin.**—*Phytopathology*, 43, 1, pp. 23–26, 1953.

At the Department of Plant Pathology, University of Wisconsin, Madison, an antibiotic tentatively designated toximycin (abs. in *Phytopathology*, 42, p. 20, 1952) was partially purified by fractionation of shaken cultures of an isolate of *Bacillus subtilis* [*R.A.M.*, 31, p. 621] from soil. Activity was estimated by the *Glomerella cingulata* agar diffusion assay [ibid., 29, p. 524]. A recovery of about half

the active material with a 34- to 65-fold purification was secured. Polypeptide tests on the antibiotic in this form gave positive results.

Among the 20 fungi and three bacteria completely inhibited at concentrations from 6·25 to 100 μgm. per ml. in agar-streak tests were *Alternaria solani*, *Botrytis allii*, *Chalara quercina*, *Colletotrichum circinans*, *C. phomoides*, *Fusarium oxysporum* f. [*F. bulbigenum* var.] *lycopersici* and *F. o.* f. *pisi*, *Helminthosporium sativum*, *H. victoriae*, *Nigrospora sphaerica*, *Pellicularia filamentosa* [*Corticium solani*], *Sclerotinia fructicola*, *Stemphylium sarciniforme*, *Streptomyces* [*Actinomyces*] *scabies*, *Venturia inaequalis*, *Verticillium albo-atrum*, and *Xanthomonas campestris*. At 2 mg. per ml. toximycin reduced the number of tobacco necrosis virus lesions on six half leaves of tobacco from 296 to 28, the corresponding figures at 1 mg. being 354 and 24.

In protectant experiments in the greenhouse with *Alternaria solani* on tomato foliage, the ED 50 and ED 95 values were found to be 44 and 300 μgm. per ml., respectively. Cuttings in solutions of toximycin absorbed up to 58·5 to 70 units each; an amount exceeding 2·5 units resulted in transient wilting and a reduction in capacity for subsequent uptake of water. Applied as a spray, the antibiotic was innocuous to five species of plants.

Pachlewski (R.). **Obserwacje nad rozwojem mykorhizy u degenerujących drzew owocowych w Szkółkach Kórnickich.** [Observations on the development of mycorrhiza in degenerated fruit trees in Kórnik Nurseries.] —*Acta Soc. Bot. Polon.*, 21, 4, pp. 577–589, 3 figs., 1952. [French summary.]

Studies at the Institute of Phytopathology and Plant Protection, University and Polytechnic, Wrocław, Poland, have revealed pseudo-mycorrhiza on the roots of poorly developed fruit trees [*R.A.M.*, 29, p. 167] growing on exhausted soil in the Kórnik Nurseries. Endotrophic mycorrhiza of the tolypophage type were found occasionally on normally developed trees growing in the same soil and were quite frequent and abundant on trees growing in normal soil. No mycorrhiza were found throughout the growth cycle of one-year-old apple trees (Antonovka variety) in a nursery hot-bed, but endotrophic mycorrhiza of the tolypophage type were observed on similar saplings growing in the field in another nursery.

Dominik (T.). **Badanie mykotrofizmu roślinności wydm nadmorskich i śródlądowych.** [Research on the mycotrophism of plant associations of coastal and inland dunes.]—*Acta Soc. Bot. Polon.*, 21, 1–2, pp. 125–164, 21 figs., 2 graphs, 1951. [French summary.]

This is a brief review of the work done so far to determine the degree of mycotrophism [see next abstract] in plant associations near Łeba, on the Baltic coast [cf. *R.A.M.*, 32, p. 31] and at Miłosna, near Warsaw, Poland. Many plant species show a very variable mycotrophism, being autotrophic in one association and mycotrophic in another, depending on the presence or absence of given fungi.

Truszkowska (Wanda). **Badania nad mykotrofizmem nizinnego zespołu łąkowego na Psim Polu pod Wrocławiem.** [Researches on mycotrophism in the low-lying ground at Psie Pole near Wrocław.]—*Acta Soc. Bot. Polon.*, 21, 1-2, pp. 195–216, 4 figs., 1951. [French summary.]

The results of the investigations on the mycotrophism of plant associations in the valley of the river Widawa at Psie Pole near Wrocław, Poland [see preceding abstract], indicate that mycotrophic plants constitute 68 per cent. of the plant association. Included among these are herbaceous plants, many of the marshland plants, and most of the Gramineae [*R.A.M.*, 32, p. 269]. Well developed root nodules on the Leguminosae indicate that mycotrophism is not excluded by

bacteriotrophism; neither is a permanent feature of certain plant species and both depend on ecological and biocoenotic conditions. Mycotrophism is slightly influenced by the mineral composition of the soil.

AKAI (S.). **Studies on the pathological anatomy of fungus galls of plants.**—*Mem. Coll. Agric. Kyoto* 58 (*Phytopath. ser.* 10), 60 pp., 4 pl., 30 figs., 1950. [Received 1952.]

In this investigation into the histology of fungus galls of plants [cf. *R.A.M.*, 32, p. 392] found in Japan the author adopts the classification into organized or histioid galls, according to whether they are abnormal organ formations, e.g. witches' broom, or abnormal tissue formations accompanying swellings of leaves, stems, or roots. Histioid galls are further subdivided into kataplasmatic and prosoplasmatic.

The epidermal cells increase in size, thus decreasing stomatal density. In most leaf galls differentiation into palisade and spongy tissue does not take place. In the cortex of hypertrophied buds of *Camellia japonica* caused by *Exobasidium camelliae* and of *Cinnamomum japonicum* invaded by *Ustilago onumai* a new formation of structures resembling cortical bundles occurs. They are usually of a collateral or bicollateral structure and probably serve as a source of nutrition from the host to the fungus.

The nuclei of deformed cells often change in shape, to a large lobulate form, or in number. A large number of nucleoli are found.

The stem wood fibres in many galls show little deposition of lignin. Chloroplasts are generally discoloured, becoming pale green. In *Brassica* plants infected by *Albugo candida* [*Cystopus candidus*], the petals became green owing to the formation of chloroplasts.

Almost all gall-forming fungi are parasitic, forming haustoria which are often covered by a cellulose layer apparently secreted by the host cell, but they do not damage the cells. All fungus galls of plants are formed as a result of stimulatory substances secreted by the fungus.

AKAI (S.). **On the anatomy of necrotic lesions on leaves and stems of plants affected by pathogenic fungi.**—*Mem. Coll. Agric. Kyoto* 61 (*Phytopath. ser.* 11), 30 pp., 25 figs., 1951. [Received 1952.]

Leaf spot lesions caused by pathogenic fungi consist of a clearly defined dead area surrounded by a zone in which the cells are still alive but diseased and they may proliferate or not. The shot hole effects in *Prunus* spp. and other plants are due to the formation of abscission cells round the spot. Leaf-spotting fungi may either penetrate the host cell walls (as *Colletotrichum lagenarium* does in watermelon) or not (*Mycosphaerella pinodes* in pea). The thorns sometimes seen on the sclerotia of *Ovulinia azaleae* are hairs produced on the cylindrical part of *Rhododendron* flowers [*R.A.M.*, 30, p. 41].

MARTIN (C.). **Contribution à l'étude des propriétés sérologiques des virus de la Pomme de terre.** [A contribution to the study of the serological properties of the Potato viruses.]—*Ann. Inst. nat. Rech. agron.*, Sér. C (*Ann. Épiphyt.*), 3, 3, pp. 393–394, 1952.

After pointing out that the serological method for the detection or evaluation of phytopathogenic viruses, particularly potato viruses, is sometimes complicated by the appearance of non-specific precipitates in the sap under test, the author describes a technique by which the development of these precipitates was prevented, the host tissues being ground up with potassium cyanide [*R.A.M.*, 32, p. 470]. Several hundred tests for potato viruses X and Y were made and the

appearance of non-specific precipitates was very rare, provided the sap was tested immediately after extraction.

Other work of a preliminary nature demonstrated the important part played by oxidation in the stability of certain virus proteins, and further studies on this subject are in progress.

FORTI (G.). **Colture all' aperto con il metodo del 'tassello' per il saggio delle malattie da virus nelle Patate.** [Cultivation in the open in conjunction with the 'plug' method of testing for virus diseases of Potatoes.]—*Notiz. Malatt. Piante, 1952*, 21, pp. 14–16, 1952. [English summary, p. 71. Mimeographed.]

In February, 1952, tests for the presence of virus diseases in seed potato crops [cf. next abstract] were made by growing 5,000 tuber pieces in the open air in Sicily in a locality free from aphids. The results obtained were much more satisfactory than those from greenhouse tests, as the symptoms of various [unspecified] virus diseases developed with great clearness. The open-air method is also much cheaper and gives larger yields. If necessary the tubers could be grown in Sicily in December or January.

MARINI (ENRICA). **Ancora sulla frequenza del virus X nelle Patate d'importazione e in alcune razze italiane.** [A further note on the frequency of virus X in imported Potatoes and in some Italian lines.]—*Notiz. Malatt. Piante, 1952*, 21, pp. 56–61, 1952. [English summary, p. 72. Mimeographed.]

The results of serological tests for the presence of virus X in potato tubers of different varieties imported into Italy and in plants of Italian lines are listed [*R.A.M.*, 32, p. 96]. Four varieties from Germany, six from Holland, two from Czechoslovakia, and Bintje from Denmark were free from the virus. Arran Pilot from Great Britain developed an atypical mosaic in the field, and was shown by serological tests to be infected. Among old Italian varieties Bianca di Como gave clearly positive results in almost all the tests and probably positive in the remainder, while a high percentage of the tubers of Quarantina di Como were affected. The S. Michele variety from Trento, grown near Como, was also infected. Although Tonda di Berlino [Allerfrüheste Gelbe] is usually field resistant to many strains of virus X, tubers of this variety from Pusteria, Italy, grown near Como, were infected by a virulent strain of X; as this variety sometimes carries virus A the presence of the complex A+X in a potato line already declining in Germany and elsewhere could have serious results.

YORA (K.) & KOMURO (Y.). **On the streak disease of a variety of Potato 'Norin No. 1'.**—*Ann. phytopath. Soc. Japan*, 14, 1–2, pp. 23–24, 1950. [Abs. in *Rec. Res. Fac. Agric. Univ. Tokyo*, 1 (*1950–51*), p. 10, 1952.]

Streak disease has often been noticed on Norin No. 1 potato plants in the field. The typical symptom is a leaf-drop streak very similar to the acropetal necrosis caused by potato virus Y [*R.A.M.*, 32, p. 335 and next abstract]. Mechanical inoculation with expressed sap on Norin No. 1 plants free from virus X and other test plants showed that the virus associated with the streak is potato virus Y, but the same symptoms were induced when Norin No. 1 plants were inoculated with a complex of potato X and Y viruses [ibid., 32, p. 640].

YORA (K.). **On the simple mosaic of a variety of Potato, 'Norin No. 1'.**—*Ann. phytopath. Soc. Japan*, 14, 3–4, pp. 75–78, 1950. [Abs. in *Rec. Res. Fac. Agric. Univ. Tokyo*, 1 (*1950–51*), p. 10, 1952.]

Potato tubers of three varieties, Danshaku, Benimaru, and Norin No. 1, were tested for infection with potato virus X [*R.A.M.*, 32, p. 640 and next abstract] by

inoculation with expressed sap from the tubers on *Datura stramonium*. All Danshaku and Benimaru plants were found to be infected in spite of their healthy appearance. Only a few Norin No. 1 plants were infected and all showed a very mild mosaic symptom; these plants were free from potato virus Y [see preceding abstract]. The mild mosaic corresponds to the simple mosaic of Murphy and McKay [ibid., 3, p. 601] and Dykstra [ibid., 18, p. 337]. The symptoms are often restricted to the lower old leaves, but the virus content of the upper, apparently healthy leaves, is as high as that of the lower.

Asuyama (H.) & Komuro (Y.). **Studies on the classification of Potato viruses. I. On the virus from apparently healthy Potato of variety 'Danshaku'.**—*Contr. Plant Viruses and Virus Dis., 1950*, pp. 4–12, 1950. [Abs. in *Rec. Res. Fac. Agric. Univ. Tokyo*, 1 (*1950–51*), p. 8, 1952.]

In Japan Danshaku, an old, apparently healthy potato variety, was found by a series of inoculations to contain the mild mottle strain of potato virus X [*R.A.M.*, 31, p. 202 and preceding abstract].

Broadbent (L.), Gregory (P. H.), & Tinsley (T. W.). **The influence of planting date and manuring on the incidence of virus diseases in Potato crops.**—*Ann. appl. Biol.*, 39, 4, pp. 509–524, 1 diag., 1952.

An account is given of field experiments carried out at Rothamsted Experimental Station, Harpenden, from 1945 to 1950, using Majestic potatoes (main crop, Stock Seed Certificate), to test the influence of planting date and manurial treatment on the incidence of leaf roll virus [*R.A.M.*, 31, pp. 169, 170, 200] and rugose mosaic (virus Y) [loc. cit.]. Single infected tubers were planted in known positions in each plot. One tuber from each of the five plants on each side of the infectors was planted in the following year to determine the extent of virus transmission. Insect traps were operated near the plots.

The results demonstrated that early planting, though increasing yield, also usually increased virus incidence. The average results from all comparisons showed that the greatest increase in incidence of both viruses was given by dung; ammonium sulphate increased leaf roll, and muriate of potash rugose mosaic. In two years' counts the populations of *Myzus persicae*, *Aphis rhamni*, *Macrosiphum euphorbiae*, and *Aulacorthum solani* were highest on the earlier-planted potatoes, and were increased by dung, ammonium sulphate, and superphosphate, but reduced by muriate of potash.

These results are interpreted as evidence that date of planting affects the incidence of leaf roll and rugose mosaic in two ways. Its influence on date of emergence of the shoots above ground determines the presence or absence of plants during the spring migration of aphids. It also determines the maturity and susceptibility of the plants during the summer migration. In 1949 and 1950, when the spring migrations were large and the summer ones small, most infections probably occurred in May and June, when the later plantings had not emerged, with the result that there was less virus disease in late than in early crops. In 1948, when a very small spring migration was followed by a summer migration lasting from mid-June until early August, there were no differences in incidence of the two diseases in the different plantings. The incidence of rugose mosaic equalled or exceeded that of leaf roll in 1949 and 1950, the only years with large spring migrations of *M. persicae* followed by small summer migrations. In the other years summer migrations were greater than spring ones and incidence of leaf roll greatly exceeded that of rugose mosaic.

Despite the correlation between yield and virus disease, growers of ware potatoes should aim at maximum tuber yield. The financial loss from increased disease incidence caused by early planting and adequate manuring will be insignificant

compared with the gain from increased yield. Increased leaf roll and rugose mosaic reduce the value of seed-size tubers for subsequent planting, but cause inappreciable loss of yield in the year of infection. The experiments were conducted in a ware-growing area, and the results are not necessarily applicable to seed areas, where crops are planted later.

Melenevsky (A. I.). Протравливание клубней Картофеля. [Disinfection of Potato tubers.]—Сад и Огород [*Orchard & Garden*], *1953*, 3, pp. 52–53, 1953.

During the 1951 and 1952 experiments in the Poltava region, U.S.S.R., to evaluate various chemical treatments of potato tubers against *Phytophthora infestans* [*R.A.M.*, 32, pp. 147, 395] and *Corticium solani* [ibid., 27, pp. 36, 37 ; cf. 32, p. 504], baskets containing 30 kg. potato tubers were dipped before planting for 10 minutes in various solutions. Formalin (0·2 per cent.), calcium arsenate (0·04 per cent.), and superphosphate (15 per cent.) gave the best control, i.e. no infection by *C. solani* and 1 per cent. by *P. infestans*, as against 4 and 5 per cent., respectively, for the untreated. In another experiment potassium permanganate gave the best results on non-vernalized tubers and formalin on vernalized.

Betto (E.) & Lorenzini (G.). **Risultati di prove di lotta contra la rogna nera della Patata nella Valle Spluga.** [Results of experiments on the control of Potato wart in the Spluga valley.]—*Notiz. Malatt. Piante, 1952*, 21, pp. 16–31, 1952. [English summary, p. 71. Mimeographed.]

During 1952, in further tests of potato varieties resistant to wart [*Synchytrium endobioticum*] in Italy [*R.A.M.*, 32, p. 587], four were planted in the Spluga valley. None of the test varieties developed wart, though it appeared on some of the susceptible controls and in 15 out of 24 plots of local varieties. Krasava and Majestic consistently gave high yields of tubers of good weight, but the latter developed up to 80 per cent. scab [*Actinomyces scabies*: loc. cit.] in some areas. Jakobi gave good yields but was mediocre in resistance to scab. Irish Cobbler did not give consistently high yields and had little resistance to scab.

Wenzl (H.). **Untersuchungen über den nichtvirösen Kartoffelabbau.** [Studies on non-virus Potato degeneration.]—*Z. PflKrankh.*, 60, 2, pp. 65–77, 1953. [English summary.]

In addition to information on potato wilt (*Colletotrichum* [*atramentarium*]) in Austria already presented from other sources [*R.A.M.*, 32, p. 502], the author points to the occurrence of spindle sprout (in which the sprouts are abnormally thin) and virus degeneration in the same stands. The development of thin sprouts (not due to a virus) results in small tubers of inferior seed value and causes many gaps in the stand in the field. It is thought that the diminished shading induces a poor soil structure and inadequate water conservation, resulting in greater infection by *C. atramentarium*. Non-parasitic spindle sprout may increase in successive years owing to the 'incompleteness' of the potato fields, the degenerate tubers themselves conferring no effect on the succeeding crop. Dwarfed plants from spindle-sprouted tubers are less affected by *C. atramentarium* than normal plants. In general, plants with secondary virus infection (potato mosaic) sustain less damage from *C. atramentarium* than virus-free ones, the tubers of which are specially predisposed to spindle sprout.

Cunningham (H. S.). **A histological study of the influence of sprout inhibitors on Fusarium infection of Potato tubers.**—*Phytopathology*, 43, 2, pp. 95–98, 1 fig., 1953.

At the Department of Plant Pathology, Cornell University, New York, dry rot (*Fusarium* sp.) was more prevalent in stored Green Mountain potatoes [*R.A.M.*,

25, p. 331] treated with a sprout-inhibitor than in untreated tubers kept under the same conditions. In experimental studies with *F. sambucinum* f. 6 [*Gibberella cyanogena*: ibid., 31, p. 51] the normal healing of the cut surfaces of treated tubers was delayed, wound cork being formed irregularly if at all, though the growth of the fungus was not affected in any way [cf. ibid., 29, p. 275]. A sprout inhibitor containing the methyl ester of naphthalene acetic acid retarded the healing process for a longer period than one containing tetrachloronitrobenzene.

Newbould (F. H. S.). **An actinophage for Streptomyces scabies.**—Abs. in *Rev. canad. Biol.*, 11, 5, p. 514, 1953.

Soil surrounding potatoes severely infected by scab (*Streptomyces* [*Actinomyces*] *scabies*) yielded at the Ontario Agricultural College, Guelph [see next abstract], a phage, filtered and diluted lysates of which produced plaques on incorporation with susceptible spores in semi-solid agar media. Only one out of 15 pathogenic strains proved resistant to lysis by the phage, whereas none of the 15 non-pathogenic isolates from scab lesions was actually dissolved, though two reacted to infection with large amounts of phage suspension by the development of minute clear areas. In shake cultures the optimum mycelial age, at initial infection, for phage multiplications ranged from eight to 10 or 11 hours, during which period yields were about ten times as high as those from younger or older mycelium.

Douglas (R. J.). **A serological investigation of actinomycetes from Potato scab lesions.**—Abs. in *Rev. canad. Biol.*, 11, 5, pp. 514–515, 1953.

At the Ontario Agricultural College, Guelph, antisera against several cultures of the potato scab organism [*Actinomyces scabies*: *R.A.M.*, 30, p. 189 and preceding abstract] were prepared in rabbits and chickens. The results of precipitin tests showed that serologically reactive substances are liberated into the medium during the growth of these organisms and may be concentrated by a reduction in the volume of the culture filtrate. Reactive materials were also released by repeated freezing and thawing of the mycelium. The resistance of these extracts to heat even at a high pH (8·3 to 8·7) suggests that at least a portion of the activity resides in a non-protein fraction.

The parasitic cultures appeared to be closely related, while the saprophytic forms represented a more heterogeneous group, but no clear-cut division of isolates into potential scab-producers and saprophytes is yet practicable by serological methods.

VanMiddelem (C. H.), Jacob (W. C.), & Thompson (H. C.). **Potassium fertilization effect on some soluble nitrogen constituents of the Potato tuber in relation to the black spot problem.**—*Proc. Amer. Soc. hort. Sci.*, 61, pp. 353–359, 4 graphs, 1953.

A biochemical study was conducted on Green Mountain potato tubers at Cornell University, Ithaca, New York, in relation to the effect of potassium on internal black spot [*R.A.M.*, 31, p. 513]. Heavy potassium applications resulted in a decrease in the content of tyrosine, 3,4-dihydroxyphenylalanine, total α-amino acids, and total soluble nitrogen. Tuber discoloration decreased at the same rate as the contents of these nitrogenous fractions, with each increase in potassium in the fertilizer. It is concluded that potassium may profoundly affect the incidence of internal black spot in susceptible potato tubers through its effect on the soluble nitrogenous constituents.

Cheo (P. C.). **Varietal differences in susceptibility of Sweet Potato to black rot fungus.**—*Phytopathology*, 43, 2, pp. 78–81, 1 fig., 1953.

None of the sweet potato varieties (numbering over 100) tested by root and stem

inoculation at the Plant Industry Station, Beltsville, Maryland, for their reactions to black rot (*Endoconidiophora* [*Ceratocystis*] *fimbriata*) [*R.A.M.*, 32, p. 337] proved to be immune, but some were highly resistant or resistant [cf. ibid., 5, p. 628]. In the root infection series a highly resistant (type I) reaction was expressed by circular, dry, sunken lesions, with well-defined margins, not exceeding 1 cm. in diameter after three weeks. Six seedlings fell into this category, namely, B-5941, B-5944, B-5999, B-6097, K-1716, and Oklahoma 24 (Allgold). Resistance (type II) took the form of oval, sunken lesions, with uneven margins, exceeding 1 cm. in diameter after three weeks; this category was represented by Pierson, B-52, B-5868, B-6271, E-7, Oklahoma 17, and P.I. Nos. 153905, 153907, and 153909, introduced from Japan. On susceptible (type III) roots the lesions were about 2 cm. and on very susceptible (type IV) they reached 2·5 cm.

In the stem inoculation tests seedlings B-5868, B-5941, B-5944, B-5999, B-6097, 10570, and introduction P.I. No. 190249 were highly resistant, showing no aerial symptoms, and the transplanted stem below ground was healthy, though a few of the small, spreading roots were blackened and killed. Aerial symptoms were also absent from the resistant B-25, B-6198, B-6295, K-1716, and 10561, but most of the fibrous roots were infected, small, isolated, black lesions developing on the underground portion of the transplanted stem. Some of the varieties with type I resistance frequently showed clear-cut type II symptoms but in less than 10 per cent. of the plants. High greenhouse temperatures were conducive to the recovery of infected plants. A close correlation was observed between root and stem resistance.

Aycock (R.), Cooley (J. S.), Hughes (M. B.), & Smith (W. L.). **Relation of temperature to internal cork development in stored Sweet Potato roots.**—*Phytopathology*, 43, 1, pp. 50–51, 1 fig., 1953.

At the Plant Industry Station, Beltsville, Maryland, samples of Porto Rico sweet potato roots harvested in 1950 from two sources, one with a high and the other (from a locality in northern Louisiana free from internal cork [virus]) with a low level of symptom expression, were examined for incidence and severity of the disease, some immediately and the remainder after five months' curing in storage at different temperatures [*R.A.M.*, 32, p. 505]. The high-level symptom lots yielded a significantly higher percentage of corky roots at 70° and 85° F. (87·1 and 88·7 per cent., respectively) than on lifting (43·9 per cent.) or stored at 50°, 55°, and 60° (43·3, 45·8, and 47·9 per cent., respectively). In the low-level symptom samples the highest percentage of internal cork in the roots in any one sample stored at 50°, 55°, and 60° was 3 and two samples were free from cork, but 15 per cent. of those held at 85° showed symptoms.

It is apparent that storage temperatures of 50° to 60° will prevent any appreciable development of symptoms beyond those already present at harvest. Continuous storage at 50°, however, tends to cause chilling (abs. in *Phytopathology*, 40, pp. 869–870, 1950), and a temperature of 55° to 60° is consequently recommended.

Ike (T.) & Watanabe (S.). **Influence of lodging on the damage of stem rot disease in Rice varieties.**—*Proc. Crop Sci. Soc. Japan*, 21, pp. 247–248, 1953. [Japanese, with English summary.]

In studies on the incidence of stem rot disease [*Leptosphaeria salvinii*: *R.A.M.*, 32, p. 505] on artificially lodged rice plants [carred out at the Mie Prefectural Agricultural Experiment Station, Japan], it was found that lodging at both early and late stages of growth increased the disease. Rice varieties which are normally damaged by lodging generally display low resistance to *L. salvinii* under field conditions.

Baba (I.), Takahashi (Y.), & Iwata (I.). **Studies on the nutrition of Rice plant with reference to Helminthosporium leaf spot (preliminary report). III. The nutrient absorption as affected by the water temperature. IV. Nitrogen metabolism as affected by hydrogen sulphide. V. Growth and nutrient absorption as affected by night temperature.**—*Proc. Crop Sci. Soc. Japan*, 21, pp. 233–238, 1953. [Japanese, with English summaries.]

In further studies at the National Institute of Agricultural Sciences, Japan, on the nutrition of the rice plant in connexion with *Helminthosporium* [*Ophiobolus miyabeanus*: *R.A.M.*, 32, p. 449], water culture experiments in 1951 showed that the inhibition of absorption of nutrient elements, such as silicon and potassium, occurs at supra-optimal water temperatures (over 30° C.). The percentage contents of these minerals in the leaves and stems of rice plants were decreased by exposure to high night air temperatures, resulting also in an increased susceptibility to *O. miyabeanus*. High night air temperatures for a month after heading caused rice plants to mature more rapidly, but retarded the normal development of the rice grains, thus decreasing the yield.

It is concluded that the serious occurrence of this disease in south-western Japan may be attributed in part to high temperatures inhibiting the normal absorption of such nutrients as potassium and silicon.

Jacks (H.). **Soil disinfection. XIII : an injector for field fumigation.** –*N. Z. J. Sci. Tech.*, Sect. B, 34, 3, pp. 139–145, 7 figs., 1952.

In connexion with further work on soil disinfection [cf. *R.A.M.*, 32, p. 36] in New Zealand, a description is given of a field injector [cf. ibid., 31, p. 247] attached to a tractor plough for the application of controlled dosages of volatile liquids into the soil. A pumping system is incorporated into the body of the injector and the measuring pump is worked by a device propelled by a spiked wheel travelling on the ground. Injector nozzles are positioned to deliver the fumigant into an open single or double furrow, which is covered by the slice cut off by the following ploughshare. One acre can be treated in approximately 2½ hours, fumigants being injected into furrows 1 ft. wide and 6 to 8 inches deep. Harrowing of land after treatment and the application of a light water seal are advisable, where possible.

Sadasivan (T. S.). **Some aspects of soil-borne fungal diseases of plants.**—*Palaeobotanist*, 1 (Birbal Sahni Memorial volume), pp. 400–407, 1 pl., 1 graph, 1952. [Received March, 1953.]

One of the purposes of the author in making this review of recent literature (41 titles) on soil-borne plant diseases is to stimulate interest in a field hitherto neglected by Indian research workers. Work is described on the saprophytic activity of certain fungi in soils and on micro-elements affecting their growth in culture and in the soil, especially in relation to wilt diseases [*R.A.M.*, 32, p. 36]. Notes are given on unpublished work by [Miss] C. Thankam on the biological control of soil-borne fungi, especially *Fusarium vasinfectum*, by bacteria.

Harris (J. R.). **Influence of rhizosphere micro-organisms on the virulence of Rhizobium trifolii.**—*Nature, Lond.*, 172, 4376, pp. 507–508, 1953.

While investigating the plant-rhizobial relationships between *Trifolium subterraneum* and strains of *Rhizobium trifolii* [*R.A.M.*, 31, p. 449] in pot experiments at the Waite Agricultural Research Institute, Adelaide, South Australia, strain No. 44 was observed to give an ineffective reaction (as measured by plant growth) in heat-sterilized soils, whereas in similar non-treated soils an effective reaction was obtained. To test the effect of associated fungi on nodulation, sterilized

subterranean clover embryos were grown aseptically on a mineral salts-soft agar medium free from nitrogen and carbohydrates. When the first trifoliate leaf had unfolded the seedlings were inoculated simultaneously with *R. trifolii* and a suspension of one of the fungi frequently isolated from clover roots in non-sterile soils.

The presence of a parasite capable of killing the plant rapidly inhibited nodulation completely, as in the case of *Fusarium* 1013 and *Sclerotinia* 1015. Where the degree of parasitism was less marked but root invasion occurred with extensive local root rots, as in the case of the dematiaceous fungus 1017 and *Hormodendrum* N, nodulation with strain 430 of *R. trifolii* was reduced, probably owing to impaired metabolism in the plant rather than to direct antagonism of the fungus to the rhizobia. Some strains of fungi and bacteria were capable of stimulating the weakly virulent strain 44, but had no effect on the more active strain of the bacterium.

Halabuda (T. V.). Новые виды из рода **Penicillium Link.** [New species of the genus *Penicillium* Link.]—Бот. Матер. (*Not. syst. Sect. crypt. Inst. bot. Acad. Sci. U.S.S.R.*), 6, 7–12, pp. 161–169, 9 figs., 1950.

In studies on the mycoflora of ten types of soil from the vicinity of Kiev, U.S.S.R., in 1944–5, *Penicillium* isolates appeared most frequently [*R.A.M.*, 32, pp. 450, 643]. Descriptions are given of nine new *P.* species which were secured.

King (N. C.). **Results of mosaic tolerance trials.** –[*Proc.*] *S. Afr. Sug.* (*Tech.*) *Ass.*, 8 pp., 3 pl., 17 figs., 1953.

The sugar-cane mosaic yield experiments in Natal [*R.A.M.*, 31, p. 143] have been harvested for a further two years. The results showed that Co.281, Co.301, N:Co.291, and N:Co.339 are very susceptible but tolerant. In the yields of the first three varieties there was no difference between plots planted with mosaic-diseased sets and those started with healthy cane. N:Co.310, N:Co.349, and Co.331 are susceptible and intolerant, N:Co.310 having a significantly lower yield when planted from diseased cane [cf. ibid., 32, p. 645].

A new experiment was started in January, 1950, and has been harvested twice. The loss of yield in N:Co.310 and N:Co.349 was due to thinner and lighter canes while in Co.331 it was due to fewer sticks on diseased plots. There is evidence that if N:Co.310 is allowed to ratoon long enough it may completely recover from the disease.

Hughes (S. J.). **Fungi from the Gold Coast. I.**—*Mycol. Pap., Commonw. mycol. Inst.*, 48, 91 pp., 32 figs., 1 map, 1952. 20*s.*

This annotated list includes 300 species of fungi, mostly from collections made in the Gold Coast and Togoland by the author between April and June, 1949, and the remainder from specimens previously deposited in Herb. I.M.I. by F. C. Deighton, R. H. Bunting, and others. It supplements the previous list [*R.A.M.*, 20, p. 315 and next abstract] by adding 217 new records. Three new hyphomycetous genera are described and 15 new species of Ascomycetes. The species are arranged in alphabetical order of the generic name and the list is preceded by a systematic list of generic names and followed by a host index.

Hughes (S. J.). **Fungi from the Gold Coast. II.**—*Mycol. Pap., Commonw. mycol. Inst.*, 50, 104 pp., 49 figs., 1953. 20*s.*

In this second contribution to the fungus flora of the Gold Coast and Togoland [see preceding abstract] a further 173 species are listed, 141 of which are new records for the territory. Nineteen new species and varieties are described and ten new combinations proposed.

Wallace (G. B.) & Wallace (Maud M.). **A supplement to a list of plant diseases of economic importance in Tanganyika Territory.**—*Mycol. Pap., Commonw. mycol. Inst.*, 51, 6 pp., 1953. 3*s*.

This list of plant diseases in Tanganyika supplements that given in *Mycol. Pap.* 26 [*R.A.M.*, 28, p. 472], bringing the records up to March, 1952 [ibid., 31, p. 225; 32, p. 117].

Togashi (K.) & Katsuki (S.). **New or noteworthy parasitic fungi in Japan.—II.**—*Sci. Rep. Yokohama Univ.*, Sect. II, 1, pp. 1–7, 4 figs., 1952.

Seventeen fungi, four of which are new, are described, two of the genus *Mycosphaerella* and 15 in *Cercospora* [*R.A.M.*, 32, p. 451]. *C. chrysanthemi* is considered to include *C. chrysanthemi-coronarii*. *C. horiana* n.sp. causes leaf spots on *Parthenocissus tricuspidata* and has 2- to 8-septate conidia 25 to 123 by 3 to 5 μ.

Jørstad (I.). **Parasitic fungi, chiefly Uredineae, from Tirich Mir in the State of Chitral, N. Pakistan.**—*Nytt Mag. Bot.*, 1, pp. 71–87, 1952.

This annotated list is of 32 species of parasitic fungi collected by the 1950 Norwegian expedition to Tirich Mir, a mountain situated in the eastern part of the Hindukush Range. Among the 26 rust fungi collected is one new species. Other interesting finds were *Ustilago violacea* [cf. *R.A.M.*, 30, p. 468] on *Dianthus angulatus*, and *Dilophospora alopecuri* [ibid., 14, p. 296; 16, p. 184; 18, p. 34] on *Calamagrostis pseudophragmites*.

Kuprevich (V. F.). Новые виды ржавчинных грибов из Таджикистана. [New species of rust fungi from Tadzhikistan.]—Бот. Матер. (*Not. syst. Sect. crypt. Inst. bot. Acad. Sci. U.S.S.R.*), 6, 7–12, pp. 169–172, 1950.

Included among the five new species of rust fungi collected in Tadzhikistan, U.S.S.R., in 1944–5 is *Puccinia rhamni* n.sp., which was found on living leaves of *Rhamnus dolichophylla*. It differs from *P. mesnieriana* in the presence of aecidia, which were on the lower side of the leaf as in *P. coronata* [*R.A.M.*, 31, p. 430] and in the form of the teleutospores, which measured 36 to 66 by 15 to 21 μ, and possessed a thickened apex (5 to 7 μ) with one to four digitiform projections attaining 9 μ in length.

Nevodovsky (G. S.). Новые или малоизученные виды Казахстанской микофлоры. [New or less well-known fungi of the Kazahstan mycoflora.]—Бот. Матер. (*Not. syst. Sect. crypt. Inst. bot. Acad. Sci. U.S.S.R.*), 6, 7–12, pp. 172–185, 8 figs., 1950.

Descriptions are given of five new and two less well-known Uredinales found during a mycological survey of Kazahstan, U.S.S.R., in 1936–8.

Nikolaeva (Mme T. L.). К флоре ежевиковых грибов (сем **Hydnaceae**) СССР. Род **Hericium Pers.** [On the flora of the spiny fungi (fam. Hydnaceae) in the U.S.S.R. Genus *Hericium* Pers.]—*Acta Inst. bot. Acad. Sci. U.R.S.S.* (*Pl. crypt.*), Ser. II, *1950*, 5, pp. 327–345, 12 figs., 1950.

Descriptions are given of the *Hericium* [*Hydnum*] species found in the U.S.S.R. [cf. *R.A.M.*, 14, p. 62; 15, pp. 63, 66, and below, p. 701], together with a key for differentiating these and related species.

Singer (R. A.). Новые основы для классификации **Panus** и родственных родов. [A new basis for the classification of *Panus* and related genera.]—*Acta Inst. bot. Acad. Sci. U.R.S.S.* (*Pl. crypt.*), Ser. II, *1950*, 6, pp. 375–387, 1950.

The author gives reasons for classifying the genus *Panus* into four genera: *Panellus*, *Panus*, *Tectella*, and *Phyllotopsis*. Descriptions are given of some of the

species occurring in the U.S.S.R. [*R.A.M.*, 14, p. 270] and also of *Schizophyllum commune*. He considers that placing *Lentinus* and *Panus* near *Marasmius* is artificial and not at all justified. *Pleurotus* is more closely related to *Panus*.

Heim (R.) & Jacques-Félix (Micheline). **Études expérimentales sur la spécificité des hyménomycètes. Nutrition et balancement des caractères morphologiques culturaux chez Armillariella mellea et Clitocybe tabescens. Les rapports de parenté entre Armillariella mellea et Clitocybe tabescens.** [Experimental studies on the specificity of hymenomycetes. Nutrition and fluctuation of the morphological cultural characters of *Armillariella mellea* and *Clitocybe tabescens*. Relations of affinity between *Armillariella mellea* and *Clitocybe tabescens*.] —*C.R. Acad. Sci., Paris*, 236, 2, pp. 167–170; 3, pp. 258–260, 1953.

From their comparative studies on the morphological characters (including luminosity) [*R.A.M.*, 6, p. 586] of *Armillariella* [*Armillaria*] *mellea* collected in the vicinity of Paris, a tropical form (*elegans*) of the same species, and *Clitocybe tabescens* from Perche (France), the authors conclude that Rhoads's separation of the two species [ibid., 25, p. 186] cannot be maintained.

Arx (J. A. v.). **Studies on Venturia and related genera.**—*Tijdschr. PlZiekt.*, 58, 6, pp. 260–266, 4 figs., 1953.

Following a brief exposition of the criteria providing the basis for a natural system of classification of the Pyrenomycetes, the characters of the Venturiaceae are described, a key to the genera is given, and the synonyms and type species are listed with critical annotations.

Batista (A. C.). **Algumas novas espécies de Phyllosticta e Phyllostictina.** [Some new species of *Phyllosticta* and *Phyllostictina*.]—*Bol. Sec. Agric. Pernambuco*, 19, 3–4, pp. 212–215, 1952.

The five new species herein described from Pernambuco, Brazil, are *Phyllosticta mangiferae* (pycnidia 145 to 210 μ diameter, conidia fusoid, 11 to 23 by 6 to 7 μ) and *Phyllostictina mangiferae* (100 to 170 μ, and 7 to 13 by 5 to 7 μ) on mango, *P. anonicola* (90 to 150 μ, and 6 to 10 by 5 to 6 μ) on *Annona muricata*, and *P. coccoicola* (87 to 150 μ and 4 to 5 by 2 to 2·5 μ) on coco-nut.

Peyronel (B.). **La forma ascofora di Valdensia heterodoxa Peyronel, tipo di un nuovo genere di Sclerotiniacee : Valdensinia.** [The ascigerous state of *Valdensia heterodoxa* Peyronel, the type of a new genus of the Sclerotiniaceae: *Valdensinia*.]—*Nuovo G. bot. ital.*, N.S., 59, 2–4, pp. 181–185, 1952. [French summary. Received October, 1953.]

A brief description is given of the perfect state of *Valdensia heterodoxa* [*R.A.M.*, 17, p. 270], an inoperculate discomycete belonging to the Sclerotiniaceae, the apothecia of which were observed in nature and obtained in the laboratory on decaying leaves of *Vaccinium myrtillus* which had been exposed to low winter temperatures. The apothecia arise from blackened midribs transformed into sclerotic pseudostromata. The author erects a new genus, *Valdensinia*, with the type species *V. heterodoxa* n.sp. Though the apothecia are of the *Sclerotinia* type, the fungus is placed in a new genus on account of the peculiar conidial state.

Jones (L. H.). **Frenching, the tabu of Tobacco men.**—*Res. in Rev., Univ. Mass.*, 2, 2, pp. 6–7, 3 figs., 1952.

The present state of knowledge of the cause of tobacco frenching disease [*R.A.M.*, 32, p. 153] is briefly reviewed, with some excellent photographs of frenched and normal plants. The combination of high soil moisture and a relatively high soil temperature is apparently necessary to activate the frenching factor, which was

present in soils in which tobacco had never been grown. Adequate drainage and little or no liming may be a protection against the disease.

Schönfellinger (H.) & Broda (E.). **Radioaktives Tabakmosaik. (Kurze Mitteilung).** [Radio-active Tobacco mosaic. (Brief note).]—*Mh. Chem.*, 83, 3, pp. 837–839, 1952.

In this joint contribution from the Chemical Laboratory and the Physical Institute of the University of Vienna, the authors describe experiments involving the testing, by means of radio-active carbon dioxide, of the photosynthetic activity of three-month-old tobacco plants inoculated with tobacco mosaic virus. The activity of the virus showed no decrease when the leaves were covered with black paper. It appears that absorbed sugar does not noticeably contribute to the measured activity of the virus.

Schlegel (D. E.) & Rawlins (T. E.). **A comparison of two methods of preparing Tobacco mosaic virus for spectrophotometric assay.**—*Phytopathology*, 43, 2, pp. 89–91, 3 graphs, 1953.

In comparative studies at the Department of Plant Pathology, University of California, Berkeley, on two methods of purifying tobacco mosaic virus for spectrophotometric assay, alternate cycles of high- and low-speed centrifugation, as used by Takahashi [*R.A.M.*, 32, p. 593], proved less satisfactory than the heating of homogenized tissues at 60° C. to coagulate impurities, followed by a cycle of low-high-low speed centrifugations. The latter method, designated 'heat-ultra', recovers a more constant percentage of the virus from homogenates over a wider range of virus concentration, besides giving less variation among replicates from a particular homogenate, the average deviation from the corresponding mean optical density being only 2·3 per cent. 'Heat-ultra' is considered to be one of the most accurate of assay techniques for tobacco mosaic virus [cf. ibid., 32, p. 345].

Moorhead (Ellen L.) & Price (W. C.). **A new serological test for Tobacco mosaic virus.**—*Phytopathology*, 43, 2, pp. 73–77, 1 fig., 1953.

Red corpuscles from sheep's blood were used as an indicator of antigen-antibody combination in a new serological test for tobacco mosaic virus devised at the Plant Virus Laboratory, University of Pittsburgh, Pennsylvania. The erythrocytes do not appear to combine in the reaction, but become entangled in the antigen-antibody network and are prevented from settling. Full directions are given for the application of the test to the assay of purified tobacco mosaic virus preparations.

Differences between the type and rosette strains of the virus and seven mutants of the former [*R.A.M.*, 31, p. 318] were detected by means of the new method; they were comparable to those found by complement fixation [loc. cit.]. Rosette was set apart by the fact that antiserum dilution end points in heterologous reactions between its antigen and the antisera for the other strains differed from those in the homologous reactions by at least four- and usually eightfold. Up to sevenfold differences among the several strains were found in the weight of virus present in the optimum reacting dilutions of antigen. The ratio of this optimum antigenic unit, as determined by the sheep erythrocyte precipitin test, to that ascertained by complement fixation was constant except for a twofold difference between the ratio for rosette and the other strains used.

Pelluchi (Luisa) & Lepori (L.). **Le virosi e le malattie virus-simili del Pomodoro segnalate in Italia.** [The viroses and virus-like diseases of Tomato recorded in Italy.]—*Notiz. Malatt. Piante, 1952*, 20, pp. 1–18, 1952. [English summary, p. 50. Mimeographed.]

The authors summarize the information available from various countries on

viroses and virus-like diseases of tomatoes found in Italy, the paper concluding with an analytical key to the chief virus diseases of tomato found in nature and to a number of virus diseases experimentally induced in this host. A bibliography of 41 titles is appended.

Alexander (L. J.) & Hoover (M. M.). **Progress report of national screening committee for disease resistance in the Tomato for 1952.**—*Plant Dis. Reptr*, 37, 5, pp. 317–324, 1953. [Multilithed.]

This is a preliminary report on the screening of wild *Lycopersicon* species and hybrids for resistance to tomato diseases by numerous co-operators in Canada and the United States in 1952. The results, summarized separately for each disease, indicate the existence of much valuable, hitherto unknown germ plasm, especially for disease resistance. Accessions with promising high resistance are listed. A more comprehensive report will be published to include the 1953 results.

Gäumann (E.), Naef-Roth (S.), & Kobel (H.). **Über Fusarinsäure, ein zweites Welketoxin des Fusarium lycopersici Sacc.** [On fusarinic acid, a second wilt toxin of *Fusarium lycopersici* Sacc.]—*Phytopath. Z.*, 20, 1, pp. 1–8, 11 figs., 1 graph, 1952.

Most of the information in this further contribution to the knowledge of fusarinic acid, a wilt-inducing toxin produced by *Fusarium* [*bulbigenum* var.] *lycopersici*, has already been presented from another source [*R.A.M.*, 32, p. 269]. It may be noted, however, that the mode of operation of the toxin depends to a great extent on the pH of the solution or of the substrate. Thus, within the acid range, e.g. at 4·3, both the stems and leaves of tomato shoots are damaged, whereas at levels exceeding 6·2 only the foliage suffers.

Guba (E. F.). **New Tomatoes, the result of twenty years of research.**—*Res. in Rev., Univ. Mass.*, 2, 2, pp. 16–17, 1952.

A new variety of red tomato, Waltham Mold-Proof Forcing, totally immune from leaf mould (*Cladosporium fulvum*) [*R.A.M.*, 31, p. 542], has been developed at Waltham Field Station, Massachusetts. The immunity of this variety is derived from *Lycopersicon peruvianum*.

Leopold (A. C.) & Guernsey (Frances S.). **The effect of nitrogen upon fruit abnormalities in the Tomato.**—*Proc. Amer. Soc. hort. Sci.*, 61, pp. 333–338, 5 graphs, 1953.

In experiments carried out at the Agricultural Experiment Station, Lafayette, Indiana, on the effects of varying the nitrogen level in Michigan State Forcing tomatoes grown in gravel beds watered with nutrient solution, it was found that blossom-end rot [*R.A.M.*, 31, p. 213 and next abstract], green locules, and white placentas were all most common at the high nitrogen level (400 p.p.m.). The occurrence of blossom-end rot was not increased by the use of PCA (parachlorophenoxyacetic acid) for fruit setting [cf. ibid., 32, p. 648].

Evans (H. J.) & Troxler (R. V.). **Relation of calcium nutrition to the incidence of blossom-end rot in Tomatoes.**—*Proc. Amer. Soc. hort. Sci.*, 61, pp. 346–352, 1953.

In work at the North Carolina Agricultural Experiment Station, Raleigh, on blossom-end rot of tomatoes [see preceding abstract] it was found that the application of 1,000 lb. calcium oxide and two sprays of 1 per cent. calcium chloride solution reduced the incidence of the disorder in the field from 17·7 to 13·1 per cent. In greenhouse experiments cultures sprayed each week with calcium chloride

solution developed fewer fruits with blossom-end rot (26 per cent.) than comparable cultures sprayed with water (56 per cent.). Injection of tomato fruits with sterile calcium gluconate solution completely prevented the disorder. The results of these experiments are in agreement with the theory that blossom end rot is caused by an insufficient supply of calcium for the synthesis of the rigid cell walls of the tomato.

Ito (T.). **The white stem blight of trees in Japan, with 1 plate.**—*Misc. Inf. Tokyo Univ. Forests*, 8, pp. 79–87, 1 pl., 1952. [Abs. in *Rec. Res. Fac. Agric. Univ. Tokyo*, 2 (*1951–52*), pp. 55–56, 1953.]

White stem blight (Kempi-byo) occurs in forests in the warm temperate zone of Japan, attacking a number of forest trees and shrubs, 37 species in 21 families being listed so far. A silky white mycelial mat covers the bark of the trunk and branches and finally kills the tree. Later a yellowish-brown fruit-body with smooth, fusiform-elliptical spores, 7 to 8·5 by 3 to 4 μ is formed, which seems to belong to a species of *Cytidia*. The wood turns first pale purple then yellowish, finally greyish-white. The optimum growth of the fungus takes place near 28° C. and is interrupted at 33°.

Nikolaeva (Mme T. L.). Новый вид **Hydnum schestunovii mihi.** [A new fungus *Hydnum schestunovii* n.sp.]—Бот. Матер. (*Not. syst. Sect. crypt. Inst. bot. Acad. Sci. U.S.S.R.*), 6, 1–6, pp. 87–88, 2 figs., 1949.

A description is given of *Hydnum schestunovii* n.sp. which was collected from an oak trunk (*Quercus pedunculata*) in the Northern Caucasus, U.S.S.R., in 1911.

Barnett (H. L.). **Isolation and identification of the Oak wilt fungus.**—*Bull. W. Va agric. Exp. Sta.* 359T, 15 pp., 10 figs., 1953.

The author describes his method [*R.A.M.*, 31, p. 357] for the isolation and rapid identification of the oak wilt fungus (*Endoconidiophora fagacearum*) [or *Chalara quercina*: *R.A.M.*, 32, p. 595 and next abstracts]. A semi-synthetic glucose-phenylaniline agar has been found very satisfactory for plate cultures.

Curl (E. A.), Stessel (G. J.), & Zuckerman (B. M.). **Subcortical mycelial mats and perithecia of the Oak wilt fungus in nature.**—*Phytopathology*, 43, 2, pp. 61–64, 1 fig., 1953.

Large mycelial mats of *Chalara quercina* [*R.A.M.*, 32, p. 650 and preceding and next abstracts] were present on the inner surface of the loose bark and outer surface of the wood of oak trees killed by the pathogen in Illinois during the autumn and winter of 1951 and the spring of 1952. Larvae and adults of three species each of Scolytidae and Cerambicydae and four of Buprestidae were frequently observed in direct association with mycelial mats below the bark of dead trees [cf. ibid., 32, p. 596]. Sclerotioid pads [see next abstract] were present in the centres of the mycelial mats on 20 of the 22 trees, usually situated immediately beneath cracks in the bark, and similar structures were produced *in vitro* by cultures of *C. quercina* on chestnut meal agar after three weeks' maintenance at 8° C. Pure cultures of the fungus were obtained by direct transference from mycelial mats and sclerotioid pads and proved pathogenic on inoculation into seedling oaks. Pieces of bark and wood showing no perceptible mycelium on removal from wilted black and red oaks (*Quercus velutina* and *Q. borealis maxima*) rapidly developed large sporulating mats of *C. quercina* when kept in a moist box or left lying on the forest floor.

Stessel (G. J.) & Zuckerman (B. M.). **The perithecial stage of Chalara quercina in nature.**—*Phytopathology*, 43, 2, pp. 65–70, 1 fig., 1953.

The perithecia of *Chalara quercina* detected on a red oak in Illinois in October,

1951 [see preceding abstract], were embedded in subcortical mats of the fungus on the surface of the sapwood and inner bark surface. The centre of each mat was occupied by thick, greenish-black, gelatinous pads. Ascospores germinated readily and the germ-tubes gave rise to endoconidia.

Typical wilt symptoms appeared in three to six weeks on trees inoculated with monoconidial isolates from a mycelial mat, from masses of ascospores or mono-ascospore cultures from perithecia found in nature. *C. quercina* was reisolated from the infected material.

Moreau (C.) & Moreau (M[ireille]). **Étude mycologique de la maladie de l'encre du Chêne.** [A mycological study of ink disease of Oak.]—*Rev. Path. vég.*, 31, 4, pp. 201–231, 3 pl., 1952.

This is an expanded account of information already noticed from another source [*R.A.M.*, 31, p. 152]. After stating that ink disease of oak in France [ibid., 32, p. 595] appears to be due essentially to *Phytophthora cinnamomi* [loc. cit.], which causes important internal necroses, though secondary wound parasites, namely, species of *Nectria* and a species of *Phoma*, are almost always present as well, the authors give a full description of the morphological characters of the fungus, isolated from the cambium of a trunk of *Quercus borealis* from the vicinity of Sare (Basses-Pyrénées). Inoculation experiments are in progress, and meantime the effect of a culture of the authors' strain on tissues of *Q. borealis* and chestnut has been studied. It was found that the mycelium invaded all the tissues, including the central callus, in a few days, the infected material turning brown and the brown pigment diffusing rapidly in the agar. Infection of oak cambium appeared to be less rapid.

The authors propose the name *Nectria rubi* f. *quercina* n.f. (conidial state *Cylindrocarpon janthothele* f. *quercina* n.f.) for a fungus found on trunks of *Q. borealis* from the forests of Saint-Pée-sur-Nivelle, Ainoha (Danscharia), and Sare, on trunks of *Q. pendunculata* from Saint-Pée-sur-Nivelle, and on *Q. toza* from Sare. The superficial perithecia, resting on a small plectenchymatous stroma, are occasionally isolated, more often arranged in tubercle-like masses of 3 to 12. Each perithecium has a globose to subglobose part surmounted by a flat surface with a marginal ridge and a small central nipple with the ostiole. The colour ranges from pale orange-red to brick or dark red. When the perithecia are very old they turn brown. They measure 430 to 500 by 350 to 450 μ, the flat surface is 220 to 270 μ in diameter, the ridge is 50 to 90 μ thick, and the nipple 20 to 50 μ high and 50 to 80 μ in diameter at the base. The asci are 100 to 130 by 10 to 15 μ, and the ascospores 12 to 14 by 5 to 7 (extremes 9 to 17 by 4 to 8, mean 13 by 5·8) μ. The subcylindrical, slightly arcuate conidia (radius of arc 100 μ) are very slightly narrower at the base than at the summit, and are rounded at both ends. The measurements varied with the strain, and the number of septa depended chiefly on the age of the culture. In 22-day-old cultures of the different strains the 3-septate ones (2 per cent.) measured 47 to 56 by 5 to 6 μ, mean 51 by 5·5 μ; 4-septate (1 per cent.) 55 to 67 by 3 to 5 μ, mean 59 by 4 μ; 5-septate (96 per cent.) 53 to 75 by 4 to 7 μ, extremes 49 to 90 by 3 to 8 μ, mean 63·5 by 5·5 μ; and 6-septate (1 per cent.) 72 by 8 μ.

Associated with *N. rubi* was *N. flavo-viridis* f. *macrospora* n.f., found on the surface of the bark at the edge of canker-like lesions on two *Q. pedunculata* trees at Saint-Pée-sur-Nivelle. The perithecia were a vivid red. The hyaline, bicellular ascospores measured 10 to 16 by 4 to 8 μ (mean 12·6 by 6·5 μ). In culture a *Fusarium* state was obtained. The subcylindrical conidia tapered towards the base, which was rounded, the apex being almost hooked; occasionally they were straight. In culture after 22 days the conidia of a strain from one tree measured: 3-septate (19 per cent.) 48 to 52 by 4 to 5 μ, extremes 45 to 54 by 4 to 5 μ, mean 49 by 4·3 μ; 5-septate (80 per cent.) 55 to 70 by 5 to 6 μ, extremes 48 to 75 by 4 to 7 μ, mean 61 by 5·3 μ;

and 7-septate (1 per cent.) 85 by 5 μ. The conidia of a strain from another tree measured: 3-septate (10 per cent.) 40 to 52 by 3 to 6 μ, mean 46 by 4·5 μ; 5-septate (90 per cent.) 49 to 62 by 4 to 6 μ, extremes 42 to 65 by 3 to 7 μ; mean 55 by 5·2 μ.

Nectria galligena was found at the base of a trunk of an affected *Q. borealis* at Sare. It probably played a secondary though not negligible part in the disease.

A *Phoma* close to *P. aposphaerioides*, but without large globules in the spores, was isolated from every specimen of diseased oak tree examined, though no fructifications were ever visible on the surface of the trunks. In culture the pycnidia ranged from 50 to 135 μ in diameter. The unicellular, hyaline, elliptical to ovoid spores measured 3 to 4 by 1·5 to 2 μ.

The authors discuss the status, history, host range, and distribution of *Phytophthora cinnamomi* and compare it with *P. cambivora* [ibid., 30, p. 128]. Ink disease has been found only on old oak trees, but *P. cinnamomi* may possibly be present in young trees which display no symptoms of the condition. Since the black exudate may be due to divers causes it is essential that the isolation of *P. cinnamomi* be secured before it can be stated definitely that a tree is cankered. The importance of the presence of this new disease of oak in south-western France is emphasized. A bibliography of 143 titles is appended.

WIEHE (P. O.). **The spread of Armillaria mellea (Fr.) Quél. in Tung orchards.**—*E. Afr. agric. J.*, 18, 2, pp. 67–72, 2 graphs, 3 diags., 1952.

The practice of ring-barking indigenous trees in virgin areas before planting tung (*Aleurites montana*) in Nyasaland has reduced the incidence of *Armillaria mellea* [*R.A.M.*, 30, p. 295 and above, p. 669] in these areas. The author presents both quantitative data on this reduction and further information obtained at the Tung Experimental Station, Cholo, on the spread of the fungus after it has become established in a tung orchard.

The tung trees were planted two years after the deciduous woodland trees had been ring-barked. Where individual trees had been felled previously the roots were removed as thoroughly as possible. The numbers of deaths from *A. mellea* among the 1,131 trees planted in this area were 9, 4, and 5 (i.e. 18, or 1·6 per cent.) at ages of 6, 7, and 8 years, respectively, the numbers of foci of infection (an area where two or more adjacent trees were attacked) being 7, 7, and 10, respectively. Where ring-barking had not been practised and sporadic felling had been carried out for many years, among 303 trees there was one death from *A. mellea* at the age of 5 years and only one focus of infection, the corresponding figures in the following years being 15 and 11, 21 and 14, 22 and 16, 2 and 16, and 3 and 16, respectively (i.e. a total after eight years of 59, or 19·4 per cent.).

In a plantation of 378 tung trees established in a field which had been under annual crops for about 20 years there were, respectively, 1, 7, 1, 3, and 2 deaths from *A. mellea* at 6, 7, 8, 9, and 10 years of age and 1, 5, 5, 7, and 8 foci of infection. Here the routine practice was to cut down infected trees as soon as the disease was observed, remove the roots, and cut trenches about 2 ft. deep in a square 10 to 15 ft. from the trunk, but this did not check spread. Replacement was usually effected two years after uprooting.

Thus, in ringed-bark areas there was a reduction in infection after eight years of 17·8 per cent. The foci of infection were larger in non-ring-barked areas and the amount of oil lost was approximately ten times as large as in the ring-barked. At the price prevailing in 1952 these losses during a period of eight years were equivalent to £17 and £1. 10*s.* per acre, respectively, and amounted in ten years to £54 per acre in one non-ring-barked area.

Once the fungus is established in an orchard spread probably occurs mainly by root contact. An indication of rate of spread is given by the ratio of the number

of infected trees to the number of foci of infection; the ratio for a period of eight years was 3·8 in non-ring-barked areas, 2·2 in ring-barked, and 1·7 in fields previously under arable crops.

In all the cases studied the critical period for infection appeared to be at the age of eight to ten years. After that the number of new infections declined rapidly, ratio of spread passing from 1·5 in the seventh year to 0·2 in the tenth in non-ring-barked areas, and from 1·4 to 0·2 in the arable. Further investigations are to be undertaken.

Aspitarte (T. R.), Bollen (W. B.), & Miller (P. W.). **Effects of some antibiotics and bactericides on growth of Xanthomonas juglandis and X. corylina.**—*Plant Dis. Reptr*, 37, 5, pp. 263–265, 3 figs., 1953. [Multilithed.]

In studies carried out conjointly by the Oregon Agricultural Experiment Station and the United States Bureau of Plant Industry, plate tests showed that *Xanthomonas juglandis* and *X. corylina*, responsible for bacteriosis of walnuts [*R.A.M.*, 31, p. 152] and filberts [*Corylus avellana* and *C. maxima*: ibid., 30, p. 594], respectively, in the Pacific Northwest, were completely inhibited by mercuric chloride (1 in 500) and oxyquinoline benzoate (1 in 1,000), respectively; aureomycin, streptomycin, terramycin, crystal violet, and puratized spray caused various degrees of inhibition.

Large (J. R.). **Aeroplane spraying for Pecan scab control.**—*Plant Dis. Reptr*, 37, 5, pp. 266–268, 1953. [Multilithed.]

In aeroplane spraying trials against pecan scab (*Cladosporium effusum*) [*R.A.M.*, 31, p. 541] at Monticello, Florida, in 1952 zineb (parzate, 36 lb. plus 18 qts. volk summer oil in 100 gals. water), applied five times from 14th April to 25th July, inclusive, at a cost of $25 per acre, about equal to that of ground spraying, resulted in commercial control which was much better on the upper than on the lower parts of the trees. Severe scab was observed on many of the lower branches. The mean yields of eight Moore and eight Moneymaker trees were 52 and 144 lb. per tree, respectively, compared with 5 and 134 lb. for the unsprayed. The nuts from the unsprayed Moneymaker trees were smaller and poorer in quality than those from the sprayed trees.

Aoshima (K.). **On the heart-rot fungus of Tohi (Picea hondoensis Mayr.).**—*Misc. Inf. Tokyo Univ. Forests*, 8, pp. 89–95, 1952. [Abs. in *Rec. Res. Fac. Agric. Univ. Tokyo*, 2 (*1951–52*), p. 55, 1953.]

A white pocket heart rot of the trunks of *Picea hondoensis*, very prevalent in the subalpine forests of Middle Honshu, Japan, where half of the stand is affected in some regions, is due to *Fomes jezoensis*. In Hokkaido it attacks *P. jezoensis*. Comparative cultural studies showed the fungus to be closely related to *Trametes* [*Fomes*] *pini*, since both form swellings on the mycelium when cultured on agar media.

Nikolaeva (Mme T. L.). Новый вид из рода **Irpex**. [A new fungus of the genus *Irpex*.]—Бот. Матер. (*Not. syst. Sect. crypt. Inst. bot. Acad. Sci. U.S.S.R.*), 6, 1–6, pp. 85–87, 3 figs., 1949.

A description is given of *Irpex foliaceo-dentatus* n.sp. which was found on a dead beech (*Fagus orientalis*) trunk in Northern Caucasus, U.S.S.R., in 1936. The substipitate, densely imbricate pileus had a sulcate, fibrillose, white or ochraceous surface, concentrically zoned at the dark brown margin. The spores were 4·5 to 5 by 2 to 2·5 μ.

C. N. I.
DEC 1954
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ERRATA

Vol. XXXII, page 446, line 51, *for* 'early' *read* 'late'
line 52, *for* 'late susceptible, the early' *read* 'early susceptible, the main crop'